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Current Awareness Service for Toxic Substances (CATS). Cumulative Report No. 1, Part 2

Arthur D. Little, Inc.

Prepared For
Environmental Protection Agency

December 1975

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PB 250 075

CURRENT AWARENESS SERVICE
FOR
TOXIC SUBSTANCES (CATS)

CUMULATIVE REPORT NO. 1
PART II

OFFICE OF TOXIC SUBSTANCES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DECEMBER 1975

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This cumulative report contains 26 current awareness documents prepared biweekly from 26 August 1974 through 11 August 1975, during the first year of a two year project. The purpose of this project was to provide the Office of Toxic Substances (OTS), U.S. Environmental Protection Agency with information on new uses of existing chemical products and with information of obvious potential environmental concern for both new and existing chemical products.

For each biweekly document a core list of approximately 80 journals was scanned for information of interest to OTS on more than 30 topics (compounds, classes of compounds, and subject areas, e.g., model ecosystems). Abstracts were prepared for all items selected and these abstracts were presented biweekly under the assigned topics. In addition, a "General Information" section was added to accommodate abstracts for topics not included in the original list of scanning topics. Biweekly subject indexes were cumulated for this annual compilation, and an author index was added.

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December 1975

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Office of Toxic Substances
Environmental Protection Agency
Washington, D.C. 20460

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C-77355

CATS Biweekly Reports
Nos. 13 - 26

Anon
CHEMICAL COMPANIES TEAM UP FOR EARLY WARNING ON 'MORE VCMs'
Chem. Wk. 116 (5): 44-5 (Jan. 29, 1975)

Eleven chemical manufacturers have formed the Institute for Chemical Toxicology (ICT) as a research center to study the biological effects of large-tonnage, big-volume chemicals. ICT's aim is to provide early warning on potential carcinogens or otherwise hazardous chemicals. The recent furor over the potential carcinogenicity of vinyl chloride monomer and the more recent disclosure that vinylidene chloride monomer may be another carcinogen has spurred industry to action. Industrial Bio-Test is already under contract to test acrylonitrile.

13-0002
ARSENIC

Anon
AT SHERWIN-WILLIAMS, CHANGE IS MORE THAN LOGO DEEP
Chem. Wk. 116 (5): 34-5 (Jan. 29, 1975)

Among many new changes, Sherwin-Williams has eliminated its arsenic chemicals plant at Bound Brook, N.J.

13-0003
ARSENIC

Cookson, J.B. et al
CANCER OF THE LUNG IN RHODESIAN BLACKS
S. African Med. J. pp. 2314-8 (Nov. 16, 1974)

Although some Africans seem to be less prone to lung disease than Europeans or North Americans, a retrospective survey of the disease in Rhodesia (where the disease is more common than in some other African countries) shows that lung cancer develops from smoking and from mining, especially gold mining. Arsenic is an impurity in many non-ferrous ores and there is a high arsenic content, in the rock of some Gwanda gold mines of Rhodesia. Black workers in the mines have developed lung cancer and have had arsenical hyperkeratoses of the skin.

13-0004
ARSENIC

Anon
TIGHT REIN ON ARSENIC
Chem. Wk. 116 (5): 16-7 (Jan. 29, 1975)

OSHA is bearing down on inorganic arsenic as an alleged carcinogen, proposing a workplace maximum exposure limit of 0.004 mg/cu m and an action level of 0.002 mg/cu m. The exposure limit for any 15-minute period will be dropped from the current 0.5mg limit to 0.01 mg/cu m.

Prompting the move were Dow and Allied reports implicating arsenic as a potential carcinogen.

13-0005
ARSENIC

Stender, John
INORGANIC ARSENIC. PROPOSED EXPOSURE STANDARDS
Fed. Register 40 (14): 3392-3404 (Jan. 21, 1975)

OSHA's proposed standard for exposure to inorganic arsenic (except for lead arsenate and arsine) notes that oral ingestion of arsenic causes such problems as nausea, irritation, inflammation and ulceration of the mucous membranes and skin, dermatitis, muscular paralysis, liver and kidney damage, and death. In industry, inhalation has allegedly caused cancer.

13-0006
ARSENIC

Anon
MANUFACTURERS AND USERS OF INORGANIC ARSENIC COMPOUNDS. . .
Chem. Eng. 82 (3): 20 (Feb. 3, 1975)

OSHA's proposed work exposure standard for inorganic arsenic (0.004 mg/cu m) is ten times stricter than the 0.05-mg limit recommended by NIOSH in 1974 and 100 times more stringent than the 0.5-mg limit now in effect. The OSHA limit is expected to shake users and manufacturers of inorganic arsenic compounds, who will have to gear up to this virtually "no detectable" level. OSHA's decision is based on the, at present, somewhat controversial view of arsenicals as carcinogens.

13-0007
ARSENIC

Scarborough, Gene A.
THE MECHANISM OF ARSENATE INHIBITION OF THE GLUCOSE ACTIVE TRANSPORT SYSTEM IN NEUROSPORA CRASSA
Arch. Biochem. Biophys. 166 (1): 245-50 (1975)

Two glucose transport systems, a non-energy requiring system and an energy-requiring active transport system have previously been identified in wild type cells of *neurospora crassa*. Because studies with the metabolic poison, arsenate, showed a marked inhibition of the glucose active transport system with only a slight depression of the cellular ATP levels, additional studies were deemed desirable. The results indicate that arsenate inhibition of the glucose active transport system in these cells involves transport of arsenate into the cells via the orthophosphate transport system, reduction of the arsenate to arsenite, and interaction of the latter with a component of the glucose active transport system. The proposal is supported by the fact that in cells treated with sodium arsenite there is a similar inhibition and that arsenite inhibition of transport is completely reversed by mercaptomethanol.

Nozaki, Shigeru
STUDIES ON ARSENIC METABOLISM. IX. ADDED ARSENITE IN DIET, THE ENSUING CONTENT AND INCREASE IN EACH ORGAN
Folia Pharmacol. Japonica 70 (5): 707-18 (1974) (In Jap. Tables and Charts In English)

When rats were fed a milk diet containing arsenite, brain arsenite content did not increase in the whole organ or the organ per g, even at a level of over 550 ppm added arsenite; kidney arsenite content did not increase even with more than 200 ppm. Arsenite content in liver and spleen, however, did increase. Rats fed a cereal diet with added arsenite showed an increased content of arsenite in brain, liver and spleen (whole organ and organ per g) in parallel with the amount of added arsenite. No increase was noted in the kidney (whole organ), even when arsenite was increased to over 200 ppm.

*13-0009
ASBESTOS

Pontefract, R.D. and Cunningham, H.M.
PENETRATION OF ASBESTOS THROUGH THE DIGESTIVE TRACT OF RATS
Nature 243 (5406): 352-3 (June 8, 1973)

Asbestos fibers, found in drinking water, beer, and other beverages, have been shown to penetrate the mucosa of the stomach and intestine, and have been found in a gastric carcinoma. To determine if orally consumed asbestos could pass through the gut and into the blood stream and tissues, a suspension of chrysotile asbestos fibers was injected into rat stomachs. The reported results showed that the fibers did indeed appear in the blood and accumulate in various tissues of the body.

Anon
FIRE RETARDANCE
Mod. Plast. 52 (1): 125-6 (1975)

Additions to the series, "Progress of Fire Retardants," edited by V.M. Bhatnagar are Vol. 5, "Advances in Fire-Retardant Textiles," and Vol. 6, "Flammability of Sandwich Panels," are announced by Technomic Publishing Co., Inc., 265 W. State Street, Westport, Conn. 06880. Vol. 5 is $45; Vol. 6 is $25.

Anon
COSTLY FLAME STANDARDS TO COVER ALL APPAREL?
Text. World 125 (1): 23 (1975)

Flammability standards under study by the Consumer Product Safety Commission may cost consumers an additional $6 billion because of increased production and finishing costs for apparel fabric. In year ending April 1974, over 5.5 million household and personal property fires occurred in which items ignited were food and grease, appliances, and fabrics, in that order. A total of 159,000 clothing fires were reported; other fabrics were involved in 69,000 fires.

*13-0012
FLUOROCARBONS

Anon
THE 30 EXISTING SSTs WON'T AFFECT THE EARTH'S OZONE LAYER. . .
Chem. Wk. 116 (5): 36 (Jan. 29, 1975)

According to the DOT report, "The Effects of Stratospheric Pollution by Aircraft," the 30 SSTs (16 Anglo-French Concordes, 14 Soviet Tu 114) now flying or about to be put into service will not change the earth's ozone layer. However, a larger fleet would be expected to have some effect, unless engine emissions are strictly limited.

*13-0013
FLUOROCARBONS

Chemical Specialties Manufacturers Association
HALOCARBONS AND THEIR POSSIBLE EFFECT ON THE STRATOSPHERE
Soap, Cosmet. Chem. Spec. 51 (1): 40,42,85,87,89,110 (1975)

This review of the ozone hypothesis, the make-up of the earth's atmosphere, ozone and its formation, the generation of chlorine atoms and their removal from the stratosphere urges against hasty conclusions on the threat to human health from fluorocarbons. Results of industry studies on the fate of fluorocarbon gases will be shared with government agencies and the public.

*13-0014
FLUOROCARBONS

McCarthy, Raymond L.
CHLOROFLUOROCARBONS IN THE ATMOSPHERE. . .
Soap, Cosmet. Chem. Spec. 51 (1): 76-78 (1975)

The current chlorine-ozone hypothesis indicating a potential danger (skin cancer, crop destruction, changes in the earth's climate) from the reaction of chlorofluorocarbons in the atmosphere is now just speculative, claims this author. After a brief history of chlorofluorocarbons, in which he cites that fluorocarbons 11 and 12 are non-flammable, chemically inert, have a low degree of toxicity, and have not been shown to be hazardous to man, plant, or animal, he discusses the impact of their production.

Chlorofluorocarbons are produced by about 25 manufacturers throughout the world with six U.S. manufacturers producing only about 50% of total production. In 1975, their production will contribute over $8 billion to the U.S. gross national product and employ over 200,000. They are in wide use for various purposes; refrigerants, aerosols, blowing agents for foams. As refrigerants, they have replaced ammonia, sulfur dioxide or methyl chloride, which have been judged "highly toxic materials."

Other compounds are believed to contribute chlorine to the atmosphere, and at least one study indicates an increase in the concentration of stratospheric ozone during the past decade.

World producers have supported extensive research on their effects in the troposphere; now will study effects in the stratosphere. The author suggests research to determine whether the hypothesized chlorine-ozone reactions could take place, and recommends discontinuing production of any chlorofluorocarbons that might be shown to be a threat to health.

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*13-0015
FLUOROCARBONS

Anon
AEROSOLS AND OZONE: UNANSWERED QUESTION
Soap, Cosmet. Chem. Spec. 51 (1): 14 (1975)

The fluorocarbon/ozone controversy was the subject of Congressional hearings on House Bill 17577, proposing a ban on fluorocarbon propellants in aerosol packages. Scientists and industry representatives presented opposing views, but all seemed to agree on the need for further studies.

A puzzling aspect: if accurate predictions of future ozone depletion are possible, why is there no explanation for the noticeable increase in the ozone layer from 1957 through 1970, a period of high fluorocarbon propellant production?

*13-0016
FLUOROCARBONS

Dudley, A.W., Jr. et al
EFFECT OF CHRONIC LOW-LEVEL EXPOSURE TO HALOTHANE ON HEPATIC MICROSOMAL ENZYME ACTIVITY
Abstr. of Paper presented at the Scientific Sessions of the 72nd Annual Meeting of Pathologists and Bacteriologists and the 11th Annual Meeting of the Pediatric Pathology Club, New Orleans, La., March 1-4, 1975

Pregnant rats exposed to 10 ppm halothane for 8 hr/day, 5 days/week from conception or shortly thereafter for varying time periods were found to experience a persistent reduction in microsomal enzyme activity. Brief discussion of implications for operating room personnel is given.

[Abstract in: Am. J. Pathology 78 (1): 14a (1975)]

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*13-0017
FLUOROCARBONS

Chang, L.W. et al
ULTRASTRUCTURAL PATHOLOGY OF THE LIVER AFTER CHRONIC EXPOSURE TO HALOTHANE
Abstr. of Paper presented at the Scientific Sessions of the 72nd Annual Meeting of Pathologists and Bacteriologists and the 11th Annual Meeting of the Pediatric Pathology Club, New Orleans, La., Mar. 1-4, 1975

Examination of the livers of adult rats exposed to 10 ppm or 500 ppm halothane for 8 hr/day, 5 days/week, for 8 weeks or 4 weeks, respectively, showed light cells with some edematous cyctoplasm, dark cells, areas of focal cytoplasmic degradation, and various other effects. The results suggest that halothane is a potential occupational hazard.

[Abstract in: Am. J. Pathology 78 (1): 14a-15a (1975)]

*13-0018
FLUOROCARBONS

Anon
OZONE CONTROVERSY REACHES CONGRESS
Aerosol Age 20 (1): 6-7 (1975)

Review of Dec. 11 and 12, 1974 hearings before the Public Health and Environmental Subcommittee of the House Commerce Committee at which scientists and industry representatives discussed the ozone controversy.

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*13-0019
FLUOROCARBONS

Bruns, L.E.
PLASTICS IN NUCLEAR PROCESSING PLANTS
Chem. Eng. Prog. 71 (1): 59-62 (1975)

During the last 10 years, plastics have greatly aided to the safety and efficiency of Atlantic Richfield's plutonium scrap recovery operations. The future may bring a nearly all-plastic reclamation facility.

Plutonium's extreme toxicity demands containment of solids, liquids, and vapors containing plutonium. Plastic equipment is used throughout Atlantic Richfield's plutonium reclamation facility (PRF) to aid in containment. Plastics such as TFE,FEP and PVF_2(Kynar) are used as liners in stainless steel pipe for the dissolvers and leaching equipment. In some cases PVF_2 (polyvinylidene fluoride) is the only satisfactory plastic, operating satisfactorily still, after 10 years of service.

One problem with plastics is radiation damage. TFE (Teflon) deteriorates rapidly with high alpha, neutron, gamma, and beta radiation. The radiation limit for Teflon is about 10^5R; for Kynar, polypropylene, polyvinyl chloride it is 10^7-10^9R; and for linear high-density polyethylene it is 10^{10}R.

Greenbaum, Leon J., Jr. et al
TOXICOLOGIC AND PHYSIOLOGIC EFFECTS OF BROMOTRIFLUOROMETHANE IN HYPERBARIC ATMOSPHERES
AD-787 004/1GA. Naval Med. Res. Inst., Bethesda, Md. Medical Res. Progress Rept. No. 2 (July 28, 1970)

Electrocardiograms, evoked visual potentials and blood gases were recorded in cats breathing bromotrifluoromethane at 165 ft. of seawater (73 psig). The cats breathed the bromotrifluoromethane (228 mm Hg) in air for five min. Heart rates were not sifnificantly altered, but the QRS intervals were increased from a control value of 0.05 to 0.06 sec. The increase in QRS interval was associated with frequent nodal beats. Respiratory rate and the Paco2 increased. Small reductions in the amplitude and increased latency of the lateral geniculate response were recorded. In cats sacrificed immediately after exposure, electron microscopic examination of the lungs demonstrated minimal engorgement of alveolar capillaries and small numbers of acute inflammatory cells. The alveolar basement membrane was thickened with vacuolation of alveolar capillary endothelium and alveolar epithelium. No morphologic changes were seen in cats sacrificed five days after exposure.

[Abstract in: Govt. Repts. Announc. 74 (26): 69 (Jan. 9, 1975)]

Anon
NEW PROCESSES AND TECHNOLOGY ALERT
Chem. Eng. 82 (3): 54-62 (Feb. 3, 1975)

Top technical developments in the chemical process industries from May through October 1974 include hydrazine and shale-oil and gas.

Produits Chimiques Ugine Kuhlmann, Lyons, France, reacts hydrogen peroxide with an imine intermediate to yield an active oxirane ring. Oxirane plus ammonia gives hydrazone, which reacts with ketone to produce a precursor of hydrazine. The company anticipates a small-scale commercial unit on stream in 1975.

In northwestern Colorado's Piceance Basin oil is being extracted from shale in a 1500-ton/day pilot plant. A 3-ton/day research project has been completed, and by 1980 a commercial plant for 100,000 bbl/day is scheduled. A newly developed retort uses steam gas recirculation (SGR) to extract 10% of the assayed value of oil from shale, and converts about 82% of the shale's thermal energy to raw shale oil and high-value gas. Direct hydrogenation to a high-quality crude eliminates the coking step.

See: 13-0025, 4,4'-Methylenebis(2-chloroaniline)

Anon
COALCON WINS COAL CONVERSION CONTRACT
Chem. Eng. News 53 (4): 8 (Jan. 27, 1975)

Under a $237 million contract administered by the Office of Coal Research, Dept. of the Interior, Coalcon Co. will design, construct, and operate a coal-to-boiler fuels demonstration plant to convert 2600 tons/day of coal to 3900 bbl/day of liquid fuels and 22 million cu ft/day of pipeline-quality gas. Scheduled for completion in eight years, the plant will provide enough fuels to power a 400-Mw electricity generation plant.

The planned process, developed by Union Carbide in the 1940's and 1950's is based on hydrocarbonization, the pyrolysis of coal in the presence of hydrogen. Liquids produced will have a heating value of 5.5 million Btu/bbl; gas, a heating value of 930 Btu/scf. A high-quality char will also be produced. A scaled-up plant in the 1980's, handling 15,000 tons/day of coal, could provide boiler fuels for a 1000-Mw electricity generating station. Coal liquefaction and gasification demonstration plant by Coalcon Co. could provide boiler fuels for 1000-Mw electricity generating station in 1980's.

13-0023
LIQUEFACTION AND GASIFICATION OF COAL

Anon
PROJECT SEACOKE. VOLUME I. APPENTIX A,B, AND C
PB-235781/12GA. Arco Chemical Co. Final Rept. Feb. 1970. Contract DI-14-01-0001-473

A process for converting coal into synthetic petroleum is discussed. The process involves the simultaneous heating of coal and petroleum residuum (akin to heavy fuel oil) to about 900 degrees F. The vapors driven off are condensed as a liquid for further standard refinery processing to gasoline and other commercial fuels. Report describes the complete experimental development program and includes a preliminary engineering design and cost estimate of a commercial scale plant.

[Abstract in: Govt. Repts. Announc. 74 (26): 74 (Jan. 9, 1975)]

Anon
PROJECT SEACOKE. VOLUME II. APPENDIX D
PB-235 782/OGA. Arco Chemical Co. Final Rept. Feb. 1970. Contract DI-14-01-0001-473.

Detailed commercial plant design is given for the Seacoke process of converting coal into synthetic petroleum.

[Abstract in: Govt. Repts. Announc. 74 (26): 74 (Jan. 9, 1975)]

Henning, H.F.
PRECAUTIONS IN THE USE OF METHYLENE-BIS-*o*-CHLOROANILINE (MBOCA)
Ann. Occup. Hyg. 17 (2): 137-42 (1974)

The title compound is used in the manufacture of such polyurethane products as integral-skin semi-rigid foam and solid urethane rubber moldings. Rats fed MBOCA were reported to have developed cancers, but dogs did not. No human cancers have been traced to the compound.

Nevertheless, caution is advised in the use of MBOCA, which should be handled only in the presence of an adequate exhaust ventilation system. Workers should avoid inhaling the dust or vapor and also avoid contaminating skin and clothing with it. In bulk operations, the use of a respirator is recommended.

13-0026
MODEL ECOSYSTEMS

Anon
MARINE ECOSYSTEMS ANALYSIS PROGRAM
Selected U.S. Govt. Publns. 4 (1): 48A (Jan. 1975)

Marine Ecosystems Analysis Program, bibliography of the New York Bight (in two parts), 1974, is available from Supt. Docs., U.S. Govt. Printing Office, Washington, D.C. 20402, at $6.15.

13-0027
MODEL ECOSYSTEMS

Schofield, William R. and Krutchkoff, Richard G.
STOCHASTIC MODEL FOR A DYNAMIC ECOSYSTEM
PB-236 933/8GA. Virginia Polytech. Inst. and State Univ., Blacksburg.
VIP-WRRC- Bull-60 W75-00559, OWRT-A-999-Va. (16). 1973.

The objective is to develop and verify, with actual data, a stochastic model of a dynamic ecosystem in a one-dimensional, eutrophic estuary. A quantitative relationship established between the causes (pollution discharge into an estuary) and the resulting effects (the wholesale degradation of the ecological environment). This cause-effect relationship includes a random component which accounts for the stochastic nature of the process. A one-dimensional model has been developed which is more general and realistic than any previous estuary model. Generalizations have been made in the differential equations which were solved and in the initial and boundary conditions used. Also included is the manner in which the physical conditions of cross-sectional areas, light intensities, freshwater flow rate, land runoff and benthal demand, water temperature, depth, and turbidity were handled. The number of components considered and the use of time-and position-variable parameters are also discussed.

[Abstract in: Govt. Repts. Announc. 74 (26): 57 (Jan. 9, 1975)]

Evans, Dale R. and Rice, Stanley D.
EFFECTS OF OIL ON MARINE ECOSYSTEMS: A REVIEW FOR ADMINISTRATORS AND POLICY MAKERS
Natl. Marine Fisheries Service, Juneau, Alaska. NOAA-74082003-1. (Nov. 1973).
COM-74-50282-03-01/G.A. [Included in Fishery Bull. 72 (3): 625-38 (July 1974)]

A broad selection of recent literature on the effects of oil on marine ecosystems is reviewed. The focus is on studies on crude oil, and the results are discussed with the purpose of providing a summary of findings that will be a useful reference for administrators and policy makers involved in decisions concerning petroleum developments and related activities. The characteristics of crude oil and factors modifying its impact on the marine environment are discussed. Most research on the toxicity of oil has dealt with acute effects and data on long-term impacts at the community level are inconclusive. It is concluded that chronic low-level pollution is potentially more damaging to ecosystems than isolated catastrophic spills. Decision makers are forced to rely on interpretative judgements rather than conclusive data.

[Abstract in: Govt. Repts. Announc. 74 (26): 55 (Jan. 9, 1975)]

13-0029
NITRILOTRIACETIC ACID

Anon
NTA RESEARCH DATA RELEASED BY HEW
Soap, Cosmet. Chem. Spec. 51 (1): 12 (1975)

Recent HEW announcement that rats fed large amounts (20,000 ppm) of nitrilotriacetic acid (NTA) over a life-time period developed a "statistically significant" number of cancerous tumors raises questions about the continuing use of NTA as a substitute for phosphate in detergents. HEW considers the test amount to be 400,000 times that of normal human exposure, and reports no visually apparent tumors in rats fed only 2,000 ppm. Not yet resolved is the question of NTA's being a carcinogen per se or causing cancer because it binds heavy metals.

13-0030
NITRILOTRIACETIC ACID

Anon
NTA IN QUESTION
Soap, Cosmet. Chem. Spec. 51 (1): 22 (1975)

In another description of HEW's findings that massive doses of NTA caused cancers in rats, mention is made of the fact that soap makers voluntarily eliminated NTA from their processes four years ago.

Michael, William R. and Wakim, Jubran M.
EFFECT OF TRISODIUM NITRILOTRIACETATE (Na_3NTA) ON THE METABOLISM OF SELECTED METAL IONS
Toxicol. Appl. Pharmacol. 24: 519-29 (1973)

Rats fed trisodium nitrilotriacetate (NTA) at dietary levels up to 2% showed an increase in urinary excretion and a decrease in fecal excretion of Zn and Ca. In general, however, total excretion of K, Mg, Na, Fe, and Cu was not affected. No changes in bone weight, no evidence change in the metabolic activity of the skeleton, no significant histopathologic effects, and no effect on liver and kidney carbonic anhydrase activity were observed. Biodegradation studies and water monitoring where NTA is used in detergents indicate that it might appear in drinking water at a concentration of 25 ppb and thus be consumed by humans at the rate of 1.4 μg/kg/day. This dietary level should not affect mineral metabolism.

Anon
SULFONAMIDE WORKS WONDERS IN SOLVENTS
Text. World 125 (1): 120 (1975)

ICI Ltd's British Patent 1,340,049 covers the solvent application of dyes and fluorescent whitening agents (FWA) containing at least one sulfonamide group/molecule. Milling the FWA with perchloroethylene before use aids dispersion.

See: *13-0032, Optical Brighteners

*13-0033
PHTHALATES

Milkov, L.E. et al
HEALTH STATUS FOR WORKERS EXPOSED TO EFFECT OF PHTHALATE PLASTICIZERS IN THE PRODUCTION OF ARTIFICIAL LEATHER AND FILMS (ON THE BASIS OF PVC RESINS).
PB-221 973-T. (Trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) 13: 14-7 (1969), by Z.Knowles)

An evaluation of the health status of 147 workers handling phthalate plasticizers (dibutylphthalate, dioctylphthalate, etc.) was undertaken in this study. Some workers showed signs of a moderately expressed toxic polyneuritis, the frequency and intensity of which increased with the length of service. The analysor function revealed an early decline in vestibular and olfactory excitability and skin sensitivity. Audiometry revealed no impairment in the threshold of hearing. Blood analysis revealed a tendency towards a drop of thrombocytes, leucocytes (neutropenia with relative lymphocytosis) hemoglobin and the blood color index. A slight reticulocytosis was also seen.

[Abstract in: Govt. Repts. Announc. 73 (18): 45 (Sept. 25, 1973)]

*13-0034
PHTHALATES

Albro, P.W. et al
METABOLISM OF DIETHYLHEXYL PHTHALATE BY RATS ISOLATION AND CHARACTERIZATION OF THE URINARY METABOLITES
J. Chromatog. 76 (2): 321-30 (1973)

The chromatographic isolation and identification of the di(2-ethylhexyl) phthalate (DEHP) metabolites found in rat urine are discussed. These metabolites indicate that DEHP is hydrolyzed to mono(2-ethylhexyl) phthalate (MEHP), and that MEHP is handled like a fatty acid in the rat.

Anon
GOODBYE, RESIN SHORTAGE? DON'T YOU BELIEVE IT!
Mod. Plast. 52 (1): 44-58 (1975)

Tightness of resin supplies in early 1974 seemed to loosen up in last half of year, but statistics indicate that such looseness was a temporary situation. Review covers sales, pattern of consumption, major markets, and U.S. supply status of various plastic materials, including polyurethanes and polyvinyl chloride.

POLYURETHANES

See: 13-0010, Flame Retardants

See: 13-0025, 4,4'-Methylenebis(2-chloroaniline)

Anon
COUNTY SUPERVISORS ADOPT THREE NEW ORGANIC SOLVENT RULES
APCD Digest (County of Los Angeles, Calif.) 4 (10): 3 (Nov.- Dec. 1974)

New rules adopted by County Supervisors restrict the use and discharge into the atmosphere of photochemically reactive solvents in dry cleaning, metal painting, and surface cleaning and degreasing commercial operations. Thus, trichloroethylene, the most common degreasing solvent less than a decade ago, will be replaced in even greater measure by increasing use of substitute, nonphotochemically reactive degreasing solvents.

13-0037
SHALE OIL EXTRACTION AND REFINING

Kirk, Alan G. II
ENERGY, THE ENVIRONMENT AND THE ECONOMY
A.G.A. Monthly 57 (1): 18-21 (1975)

EPA's Asst. Administrator for Enforcement and General Counsel, reviews the energy/environmental relationship and its economic impact. Among his comments: development of oil shale to satisfy demand for crude oil for about 100 years will become a reality when the staggering environmental problems connected with it are solved. Such problems include disposition of spent shale, source of water for mining operations, proper land revegetation, and control of the immense air pollution load.

13-0038
SHALE OIL EXTRACTION AND REFINING

Anon
OIL SHALE DEVELOPMENT. . .
Chem. Eng. News 53 (5): 16 (Feb. 3, 1975)

No drastic effects on water quantity and quality in the Piceance Basin, Colorado, from oil shale development are anticipated by the U.S. Geological Survey, if mitigating measures are effected. The highest concentration of dissolved solids in waters discharged from the mines is estimated at 5000 mg/liter. In 30 years of mining and processing, about 500,000 acre-feet of water might be removed from the two aquifers, but this is a very insignificant part of the 2.5 to 25 million acre-feet of water currently in the aquifers.

See: *13-0021, Hydrazine

13-0039
VINYL CHLORIDE

Anon
MACHINERY & EQUIPMENT. VCM REGULATIONS SPUR INTRODUCTION OF MONITORING IN INSTRUMENTS
Mod. Plast. 52 (1): 106, 108 (1975)

Review of new monitoring instruments offered to meet OSHA standards for worker exposure to vinyl chloride monomer.

13-0040
VINYL CHLORIDE

Anon
SYSTEM REDUCES VCM CONTENT IN PVC RESIN AND VENTILATES DRY-BLEND WORKPLACE
Mod. Plast. 52 (1): 98 (1975)

The Exorsta system, available from Werner & Pfleiderer Corp., Waldwick, N.J., allows reduction of the vinyl chloride monomer (VCM) content of PVC resins to about 5 to 10 ppm (from an initial content of about 1000 ppm). The reduction occurs during the dry blending operation. Simultaneously, the system ventilates the workplace keeping VCM levels in the atmosphere at or below the worker levels required by OSHA. The system described briefly here, is priced at $3000 to $6000 installed.

13-0041
VINYL CHLORIDE

Anon
A CLUE TO CARCINOGENICITY OF VCM. . .
Chem. Wk. 116 (5): 36 (Jan. 29, 1975)

In studying the mechanism of vinyl chloride monomer carcinogenicity, Harvard scientists found that rats given a phenobarbital depressant experienced liver damage at a VCM exposure level 50% lower than that required for controls. The action of phenobarbital, an inducer of liver enzymes, supports the theory that VCM interacts with a cytoplastic liver enzyme before it is activated as a liver toxin.

13-0042
VINYL CHLORIDE

Anon
POLYVINYL CHLORIDE RESINS ARE RELATIVELY STRONG
Chem. Wk. 116 (5): (Jan. 29, 1975)

PVC sales (dry resin basis) dropped to 360 million lbs in November 1974, a decrease of 4.4% compared to November 1973 sales, but production rose to 407 million lbs, an increase of 8.4%. For the year as a whole, however, sales rose about 2% and output rose 8%.

13-0043
VINYL CHLORIDE

Anon
PVC PLASTICS. . .
Environ. 17 (1): 24 (Jan/Feb. 1975)

Brief mention is made of Naval Research Lab studies on the after-effects of burning or incinerating PVC. It appears that the hydrochloric acid gas generated by burning PVC is carried by small soot particles, also evolved. These HCl-containing particles, when smaller than 3 microns, can bypass the upper respiratory system defenses and deposit HCl deep into the lung. One possible adverse effect is the development of emphysema. (See also: CATS 9-0048)

13-0044
VINYL CHLORIDE

Creech, J.L. and Johnson, M.N.
ANGIOSARCOMA OF LIVER IN THE MANUFACTURE OF POLYVINYL CHLORIDE
J. Occup. Med. 16 (3): 150-1 (1974)

Three workers in a Louisville, Kentucky, plant died from angiosarcoma of the liver during the period September 1971 to mid-December, 1973. All were employed in the manufacture of PVC resins. A fourth death in 1968 may also have been angiosarcoma, although not so reported.

These deaths indicate that exposure to PVC in the workplace may result in the development of liver angiosarcoma.

See: 13-0001, Acrylonitrile

See: *13-0019, Fluorocarbons

See: 13-0035, Polyurethanes

See also: 13-0047, General Information

VINYLIDENE CHLORIDE

See: 13-0001, Acrylonitrile

See: *13-0019, Fluorocarbons

13-0045
GENERAL INFORMATION

Anon
WEEDS THAT CAN ACT AS POLLUTION FILTRATION. . .
Chem. Wk. 116 (5): 36 (Jan. 29, 1975)

NASA scientists at Bay St. Louis, Miss., testing weeds as pollution filtration systems, report that hyacinth is successfully absorbing heavy metals (e.g., cadmium, mercury, lead), insecticides, phenols, and other hazardous chemicals from effluents generated by the National Space Technology Labs. Although the weeds can be used for this purpose only in tropical or subtropical areas, their rapid growth makes them of interest also as potential fuel or animal feed.

13-0046
GENERAL INFORMATION

Anon
RED NO. 2 –– OK
Soap, Cosmet. Chem. Spec. 51 (1): 22 (1975)

Because no harmful reproductive effects were discovered in tests conducted by FDA on the fetal toxicity of Red Dye No. 2, that agency will continue to permit use of the dye in cosmetics and foods. Earlier reports that the dye was a potential fetal toxicant have been discounted by FDA.

13-0047
GENERAL INFORMATION

Sheldon, Arthur W.
EFFECTS OF ORGANOTIN ANTI-FOULING COATINGS ON MAN AND HIS ENVIRONMENT
J. Paint Technol. 47 (600): 54-8 (Jan. 1975)

Organotin anti-fouling chemicals, although known to be irritants of the eye, skin, and upper respiratory tract, are especially useful as coatings for ships. New organotin underwater coatings developed are capable of protecting ships for over two years and work continues to develop even more effective coatings.

For this reason, their potential environmental contamination effects must be assessed.

Reported here are the results of toxicity (acute and subacute) and carcinogenicity studies on bis(tri-n-butyltin) oxide, tributyltin fluoride, and triphenyltin fluoride. Tin oxide, naturally present in soil and water, has not shown any adverse effects on animal and marine organisms. Therefore, the formation of tin oxide from the dealkylation of the organotin compounds is not seen as a cause for alarm.

13-0048
GENERAL INFORMATION

Montemarano, Jean A. and Dyckman, Edward J.
PERFORMANCE OF ORGANOMETALLIC POLYMERS AS ANTI-FOULING MATERIALS
J. Paint Technol. 47 (600): 59-61 (1975)

Because millions of dollars are expended yearly for antifouling coatings to protect ships, long-life coatings are desirable. Antifouling coating systems containing toxic copper salts have effective service lives of 3-18 months in tropical waters or 3 years in temperate waters.

The use of organometallic polymers, resinous materials into which biocidal organometallic compounds are chemically bound, was proposed. Two-year tests of panels immersed in Pearl Harbor indicate that organometallic polymers (acrylic, vinyl, polyester, and epoxy), containing tri-n-butyltin, tri-n-propyltin, trimethyltin, triphenyltin, and tribenzyltin, are low-leaching antifouling coatings witl long-life qualities.

13-0049
GENERAL INFORMATION

Leong, Basil K.J.
MACROCYCLIC POLYETHERS (Letter to Editor)
Chem. Eng. News 53 (4): 5 (Jan. 27, 1975)

Current interest in macrocyclic ethers prompted the writer to contribute a summary of his published, and some unpublished, work on the toxicity of ethylene oxide cyclic tetramer (EOCT). Rats inhaling 1.2 to 63.8 ppm EOCT experienced anorexia, body weight loss, testicular atrophy, convulsions, and other effects, including death. Repeated inhalations (0.5 to 1 ppm) caused long-lasting testicular atrophy and other effects. Effects on the central nervous system have also been noted. The writer cautions that EOCT exposure should be avoided, as should exposure to higher macrocyclic polyethers, pending further definition of their toxicity.

13-0050
GENERAL INFORMATION

Anon
PLASTIC CONTAINERS. . . ENVIRONMENTAL IMPACT. . .
Chem. Eng. News 53 (4): 9 (Jan. 27, 1975)

In a study conducted by Midwest Research Institute, plastic containers were found to cause less environmental problems than nonplastic containers. Parameters assessed included raw materials, energy, process water, solid wastes (industrial and postconsumer), air emissions, etc.

13-0051
GENERAL INFORMATION

Anon
EFFORTS TO PROMOTE MARINE BIOMEDICAL RESEARCH. . .
Chem. Eng. News 53 (4): 19 (Jan. 27, 1975)

The Marine Technology Society's Committee on Objectives and Procedures is recommending that a National Institute of Marine Biomedical Research be formed as part of a push to promote marine biomedical research. The National Institute of Environmental Health Sciences will hold a conference on this topic in Wash., D.C. in Feb. 1975.

13-0052
GENERAL INFORMATION

Anon
A PLASTIC LUNCH FOR FISH LARVA
Science News 107 (4): 56 (Jan. 29, 1975)

Plastics wastes in the ocean are apparently being ingested by fish, having been found in larva stomachs as well as in juvenile and adult fish; in marine bird pellets, gizzards and stomachs. The waste is believed to come from sewage outlets of manufacturing plants, but may also be dumped by commercial vessels dumping ocean garbage. Point of concern: plastics do not decompose.

13-0053
GENERAL INFORMATION

Anon
QUESTIONS ZIRCONIUM USAGE
Soap, Cosmet. Chem. Spec. 51 (1): 22 (1975)

Procter and Gamble Co. has reported to FDA that its zirconium-containing antiperspirants have been thoroughly safe-tested for inhalation and other exposures. FDA is studying the safety and effectiveness of all antiperspirants following recall by Gillette Co. of two new antiperspirants containing zirconium, which may produce fibrous growths in lungs after long-time inhalation. At issue: do spray antiperspirants, which break zirconium into minute particles that can penetrate deeply into the lungs, contribute to formation of granulomas and prevent the lungs from functioning properly. FDA reports no hard evidence of granulomas from zirconium yet available.

13-0054
GENERAL INFORMATION

Anon
ZIRCONIUM,. . .
Environ. 17 (1): 22 (Jan./Feb. 1975)

FDA has labeled zirconium a health hazard, after determining that zirconium sprays induced lung disease in monkeys. As a result, Procter & Gamble and Carter Wallace have been asked to withdraw their Sure and Secret deodorants from the market. Earlier, Gillette voluntarily withdrew its zirconium spray deodorant, having detected potential health problems and having noted in the 1950's that stick deodorants and poison ivy remedies containing the chemical caused skin tumors. (See: CATS 9-0043).

13-0055
GENERAL INFORMATION

Anon
CHLOROPRENE IS LATEST CANCER SCARE
Chem. Eng. News 53 (5): 4-5 (Feb. 3, 1975)

NIOSH sees 2-chlorobutadiene, or chloroprene, as a potential carcinogen following review of two Russian reports suggesting increased incidence of skin and lung cancer in workers exposed to chloroprene and adverse embryo development in rats and mice.

DuPont claims no statistically significant increase in skin and lung cancer of its workers exposed to chloroprene from 1957 to 1974.

13-0056
GENERAL INFORMATION

Anon
AN APPARENT "EPIDEMIC". . .
Environ. 17 (1): 21 (Jan./Feb. 1975)

The Columbian Committee for Environmental Information reports that the herbicides 2,4-D and 2,4,5-T may be responsible for the Guamo, Colombia, human "epidemic" involving abortions, stillbirths, and malformations. These effects are believed due to the contaminant, dioxin. About a million Colombians have been exposed to the herbicides.

14-0001
ACRYLONITRILE
(Production)

Anon
OUTPUT OF BENZENE DROPPED. . .
Chem. Wk. 116 (7): 31 (Feb. 12, 1975)

Production figures for several chemicals show drops and rises, according to the U.S. International Trade Commission. Benzene output dropped to 102.8 million gal in Dec. 1974 vs. 123.7 million gal in Dec. 1973, but total for 1974 was 1.49 gal vs. 1.45 for the whole year 1973. Ethylene and proplyene showed increased production for Dec. and for the full year over 1973 output. Dec. 1974 production of acrylonitrile dropped to 59.4 million lbs vs. 95.7 million in Dec. 1973, but production for the full year rose to 1.4 billion lbs vs. 1.35 billion in 1973. Vinyl chloride monomer showed a gain in Dec. 1974 rising to 464.6 million vs. 450.3 million in Dec. 1973, but the 5.1 million produced for the full year was less than the 5.35 million for the year 1973.

14-0002
ACRYLONITRILE
(Exports)

Starr, Homer G.
CHEMICAL TRADE TRIUMPH TRIGGERS NEW TARIFF TUSSLE
Chem. Wk. 116 (8): 11-13 (Feb. 19, 1975)

The U.S. in 1974 exported $10.3 billion worth of chemicals and allied products, or about one-eighth of domestic production. Among the compounds exported in greater amounts in 1974, compared to 1973 were acrylonitrile and tolylene diisocyanates. Slightly less vinyl chloride monomer was exported in 1974 than in 1973.

See also: 14-0017, Hexachlorobenzene

14-0003
ARSENIC

Mussman, Harry C.
DRUG AND CHEMICAL RESIDUES IN DOMESTIC ANIMALS
Fed. Proc. 34 (2): 197-201 (1975)

Because of the many chemicals that find their way into our food supply, the U.S. Dept. of Agriculture's Meat and Poultry Inspection Program conducts routine tests for chemical residues in animals that are to be slaughtered. The amount of work and methods of approach for this national residue monitoring program are discussed briefly. Sources of residues and results of monitoring are described. Chlorinated hydrocarbons comprise the largest group of compounds tested for, but heavy metals, antimicrobial agents, and growth promotants are other important classes. Metal levels in poultry, cattle and other animals are discussed. Arsenic levels in poultry are usually below 1.0 ppm. The tolerance for arsenic in poultry liver is 2.0 ppm.

ARSENIC

See also: 14-0044, General Information

*14-0004
ASBESTOS

Anon
AN UNUSUALLY RELIABLE TECHNIQUE TO IDENTIFY AND MEASURE ASBESTOS IN WATER. . .
Chem. Eng. 82 (4): 36-7 (Feb. 17, 1975)

Dow Chemical announced a new technique to identify and measure asbestos in water, which employs a transmission electron microscope with selected-area electron diffraction and an energy-dispersive spectrometer. Claiming results accurate within a factor of 2 to 3, Dow is now using the method to test for asbestos in the liquid streams at its chlorine-caustic operations based on diaphragm cells that use asbestos separators. Equipment costs up to $150,000; analysis requires 8 hours. But recent concerns re asbestos in table salt (byproduct from chlorine manufacture) and presence of asbestos in Lake Superior waters indicate potential needs.

*14-0005
ASBESTOS

Anon
WARNING ON RESOURCES
Chem. Wk. 116 (8): 14 (Feb. 19, 1975)

In "Mineral Resources and the Environment," the National Academy of Sciences reports potential depletion of world's resources of such raw materials as asbestos, mercury, helium, chromium, etc.

*14-0006
ASBESTOS

Holt, P.F.
ASBESTOSIS (Letter to Editor)
Nature 253 (5487): 85 (Jan. 10, 1975)

Commenting on P.J. Smith's article (See: CATS *6-0011), the author states that although factory conditions have improved in the last 40 years, an average of 139 new cases of asbestosis are reported yearly in Britain. No firm knowledge is available to determine a safe level of asbestos in the atmosphere. Mention is made of the IARC report, "The Biological Effects of Asbestos"(See: CATS *6-0005), which indicates that all major types of asbestos are potential carcinogens and that asbestos seems to be a cause of mesotheliomas. Exclusive of occupational exposure, the incidence of mesotheliomas in the city of Hamburg-Bergdorf, 1958-68, was 0.056% in the city as a whole, and 0.96% in the residential area around one factory.

*14-0007
ASBESTOS

Anon
EMPLOYEES AT AN ASBESTOS MINE. . .
Chem. Eng. 82 (3): 18 (Feb. 3, 1975)

If GAF closes its Lowell, Vt., asbestos mine, the employees of the mine want to buy it. GAF claims pollution equipment needed to meet EPA emission standards would make continued operation of the mine economically unfeasible. The workers, Vermont Asbestos Group, Inc., have raised $80,000, hope to borrow additional funds, and have obtained a one-year extension of EPA's deadline.

*14-0008
ASBESTOS

Farkas, Edward J.
FIBER GLASS (Letter to Editor)
Environ. 17 (1): 42-3 (Jan-Feb 1975)

Commenting on recent article by Katherine and Peter Montague (See: CATS *2-0010) on fiber glass (and asbestos), the author claims that they failed to mention that only in recent years have glass fibers been manufactured in sufficiently small diameters to be respirable, and that even the fibers with a mean diameter above the respirable range may contain fibers of respirable diameter. The Montagues in reply plead not guilty to the first charge but acknowledge overlooking the second possibility. Farkas quotes from Botham [Brit. J. Ind. Med. 30:232 (1973)] to indicate that fiber glass, as well as asbestos, when implanted in rats caused mesotheliomata. Farkas also mentions the possibility of environmental contamination from the use of fiber glass in tires and its increasing use in building materials, e.g., as a replacement for asbestos in cement.

Anon
FEED CONTAMINANT IN FARMERS' BLOOD
Chem. Eng. News 53 (8): 7 (Feb. 24, 1975)

Polybrominated biphenyl (PBB) has been found in the blood of farmers who were exposed to PBB, when it was inadvertently used as an additive in feed for dairy cattle in 1973. The PBB, a flame retardant, was mistaken for magnesium oxide, a feed additive.

Although no humans have apparently become sick from PBB, 150 people exposed to it are providing their medical histories and taking physical examinations and blood tests; another 150 are participating in the study as unexposed controls.

Cattle started getting sick in Oct. 1973 and 11,000 have since died; a total of 15,500 deaths is anticipated. Large numbers of hogs, sheep, chickens, also given feed containing PBB, have died; and millions of eggs, cheese and other such products have been buried.

14-0010
FLAME RETARDANTS

Anon
NEW FIRE RETARDANTS AND PROCESSES
Amer. Dyest. Rep. 64 (1): 34 (1975)

Flammability was the topic of more than 10 papers at the 1974 National Tech. Conference of the American Association of Textile Chemists and Colorists, New Orleans, Oct. 9-11, 1974. New flame retardants discussed included polysiloxanes under study by Dow Corning Corp.; Fyrol 76, a vinylphosphonate based compound, from Stauffer Chemical Co.; and a series of phosphoramide derivatives, especially methylol pentamethylphosphorotriamide, recommended as flame retardants for cotton textiles.

14-0011
FLAME RETARDANTS

LeBlanc, P. Bruce et al
A NEW LOW COST FR FINISH FOR INDUSTRIAL COTTON FABRICS
Text. Chem. Color. 7 (2): 38/31-40/33 (1975)

Inexpensive, applicable in a pad-dry-cure process, and coapplicable with a water repellant are properties advanced for a new, durable flame retardant for cellulosic textile materials. This combination finish contains urea, phosphate salt, chlorinated polymer and antimony oxide. Its durability may be governed by the reaction between the phosphate and the antimony.

See: 14-0009, Brominated Biphenyls

*14-0012
FLUOROCARBONS

Anon
GROUP TO PROBE FREON TIE TO OZONE LOSS
Chem. Eng. News 53 (7): 5-6 (Feb. 17, 1975)

An ad hoc Federal Interagency Task Force on Inadvertent Modification of the Stratosphere (IMOS) has been formed to investigate the potential relationship between fluorochlorohydrocarbons (e.g., Freon) and reductions in the ozone content of the stratosphere. The task force will summarize by June of this year the atmospheric, medical, and ecological data on the subject and evaluate possible economic impacts and alternatives available to the industry.

*14-0013
FLUOROCARBONS

Taylor, George J. and Drew, Robert T.
CARDIOVASCULAR EFFECTS OF ACUTE AND CHRONIC INHALATIONS OF FLUOROCARBON 12 IN RABBITS
J. Pharmacol. Exptl. Therapeutics 192 (1): 129-35 (1975)

The effects on rabbits from inhalation of 10 or 20% fluorocarbon 12 included a decline in cardiac output, a small decline in LV systolic pressure but no significant drop in mean arterial pressure, and other described effects.

*14-0014
FLUOROCARBONS

Wofsy, Steven C. et al
FREON CONSUMPTION: IMPLICATIONS FOR ATMOSPHERIC OZONE
Science 187 (4176): 535-7 (Feb. 14, 1975)

The mechanism of formation of ozone in the stratosphere and the potential ozone-depleting effects of freons are discussed. Release of chlorine from freons) to the stratosphere could cause a 3% reduction of ozone concentration by 1980, a 16% reduction by 2000, assuming Freon consumption increases by 10% per year. Banning the use of Freons by 1990 would not completely solve the problem; their effects might continue for several centuries.

*14-0015
FLUOROCARBONS

Gribbin, John
AEROSOL AND CLIMATE: HOTTER OR COOLER?
Nature 253 (5488): 162 (Jan. 17, 1975)

Brief report on the potential cooling or heating effects of aerosols on the earth's climate is summarized by the statement that the possible effects are complex, far from being understood, and that we cannot yet judge whether aerosol pollution will hasten the coming ice age.

*14-0016
FLUOROCARBONS

Anon
THE OZONE LAYER. THE CONTROVERSY OVER EFFECT OF FLUOROCARBONS ON IT CONTINUES ON MANY FRONTS
HAPPI 12 (1): 48 (1975)

Brief recaps of industry and government actions in December 1974 relative to the controversy on the possible effects of fluorocarbons on the ozone layer in the stratosphere.

Seltzer, Richard J.
OCEAN POLLUTANTS POSE POTENTIAL DANGER TO MAN
Chem. Eng. News 53 (8): 19-20 (Feb. 24, 1975)

In a 460-page report, "Assessing Potential Ocean Pollutants," the Ocean Affairs Board of the National Academy of Sciences-National Research Council has pinpointed hexachlorobenzene and transuranics as potential hazards to man and the environment. Hexachlorobenzene is persistent, resists degradation, persists in the atmosphere, and accumulates readily in organisms and food webs.

Considered among the "no threat" at this time marine pollutants are acrylonitrile and low-molecular weight hydrocarbons.

Anon
BAYER'S LEVOXIN FOR CORROSION CONTROL OF BOILER PLANTS
Anti-Corrosion 21 (111): 5-8 (Nov. 1974)

Levoxin, used to control corrosion in boiler plants, contains varying percentages of N_2H_2 (pure hydrazine). Because of the toxicity of hydrazine, residues of which are not permitted in food, the use of Levoxin in boiler plants in the food industry must be carefully evaluated. Where necessary for such boilers, an activated carbon filter in the steam circuit can help decompose the hydrazine.

Workers should be protected from toxic Levoxin fumes and avoid skin contact because of the corrosive action of Levoxin on living tissue.

See: 14-0002, Acrylonitrile

Rubin, Edward S. and McMichael, Francis C.
IMPACT OF REGULATIONS ON COAL CONVERSION PLANTS
Environ. Sci. Technol. 9 (2): 112-7 (1975)

The implications of current and future environmental air and water regulations are discussed from the viewpoint of designing, building, and operating new coal conversion plants.

Anon
BURNING COAL IN OIL-FIRED FURNACES
Anti-Corrosion 21 (111): 9-10 (Nov. 1974)

A new process for liquefying coal, announced in Britain, makes it possible for the coal to be burned in previously oil-fired furnaces without radically changing the design of conventional oil burners. The process apparently reduces soot in both the boiler and the flue gas.

14-0021
LIQUEFACTION AND GASIFICATION OF COAL

Anon
GAS FROM COAL AWARD
Chem. Wk. 116 (7): 14 (Feb. 12, 1975)

Foster Wheeler Energy Corp. has received a 40-month $8.7 million contract from Office of Coal Research to design and develop a pilot plant to produce clean, low-Btu gas from various types of coal.

14-0022
LIQUEFACTION AND GASIFICATION OF COAL

Chan, F.K.
A SASOL TYPE PROCESS FOR GASOLINE, METHANOL, SNG, AND LOW-BTU GAS FROM COAL
Kellogg (M.W.) Co., Houston, Tex. (July 1974). EPA/650/2-70-072. PB-237 670/5WK.

Costs and feasibility of manufacturing gasoline, methanol, SNG. and low-Btu gas from coal using the SASOL-type process are assessed. This process is based on a SASOL plant which has been operated commercially for more than 20 years for the manufacture of gasoline, fertilizers, and other chemicals from coal in South Africa. The SASOL plant has been modified slightly to suit the product spectrum of the projected plants. Capital investments for plants producing various end products are estimates based on published or in-house information on a mine-mouth plant using Western U.S. coal. The capital investment is expressed in 1975 dollars with no forward escalation.

[Abstract in: NTIS Weekly Govt. Abstracts, p.53 (Feb. 10, 1975)]

Anon
AMMONIA AND ALTERNATE FEEDSTOCKS
Farm Chemicals 137 (10): 44, 46 (1974)

Greater use of coal and heavy oil feeds are anticipated in the near future for the production of ammonia. Brief descriptions given of the Lurgi gasification process and the Koppers-Totzek coal dust gas process.

14-0024
4,4'-METHYLENEBIS (2-CHLOROANILINE)
(MOCA)

Anon
A LITTLE LIGHT IN THE LEGAL TUNNEL
Mod. Plast. 52 (2): 14 (1975)

The court ruling voiding OSHA's proposed standard for MOCA was based on no report of cancer in workers during almost 20 years of commercial use, even though the compound had been labeled a carcinogen on the basis of mice-feeding tests. MOCA may still not be in the clear; OSHA will undoubtedly offer a new standard.

On the other hand, OSHA's standard for VCM because of actual evidence of cancer to humans will undoubtedly be enforced, in spite of current court-ordered stay of scheduled Jan. 1 deadline for compliance.

14-0025
4,4'-METHYLENEBIS (2-CHLOROANILINE)
(MOCA)

Anon
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION. . .
Chem. Eng. News 53 (6): 7 (Feb. 10, 1975)

New standards proposed for the carcinogen, 4,4'-methylenebis(2-chloroaniline) by OSHA are the same as those previously proposed by the agency in Jan. 1974. A U.S. court voided the first standards.

Anon
NAS REPORTS ON INTERNATIONAL BIOLOGICAL PROGRAM
Science 187 (4177): 633 (Feb. 21, 1975)

A 165-page report, "U.S. Participation in the International Biological Program," published by the National Academy of Sciences, describes the 14-year effort of the IBP, which was the first large-scale attempt to apply systems analysis to the workings of ecosystems. According to the report, the findings resulting from the IBP study have been used in forest and water management, control of toxic materials, regional planning, preparation of environmental impacts, and improvements in health sciences.

May, Robert M.
STABILITY AND COMPLEXITY IN MODEL ECOSYSTEMS. MONOGRAPHS IN POPULATION BIOLOGY 6.
Princeton Univ. Press, Princeton, 1973. 235pp. $11.50

Mathematics is applied to some of the little understood, debatable issues in population biology. The author uses the Lotka-Volterra two-species predation and competition equations and adds additional species and hence trophic links to provide differential equations describing species interractions in matrix form. The author derives a major generalization that complexity tends to diminish the stability of general mathematical systems, and strengthens this generalization by extending his neighborhood stability analyses to a global perspective, and by including realism by time lags and environmental variability. Among other issues in theoretical ecology, competition and mutualistic interactions are demonstrated as destabilizing.

[Review in: Quart. Rev. Biol. 49 (4): 369-70 (Dec. 1974)]

Miller, Charles B., Ed.
THE BIOLOGY OF THE OCEANIC PACIFIC
Oregon State Univ. Press, Corvallis, 1974. $6

The status of interesting inquiries into offshore blue-water ecosystems are summarized, including a report on the zoogeographic study of open ocean zooplankton by John A. McGowan; a report on the control of ecosystem processes via a matrix of 15 biological and physical-chemical parameters judged to be interacting, interdependent components of an open-ocean ecosystem. A chapter by B.J. Rothschild includes graphs of food chain dynamics and efficiencies.

[Review in: Science 187 (4176): 532 (Feb. 14, 1975)]

*14-0029
OPTICAL BRIGHTENERS

Sturm, R.N. et al
FLUORESCENT WHITENING AGENTS: ACUTE FISH TOXICITY AND ACCUMULATION STUDIES
Water Res. 9 (2): 211-9 (1975)

Four fluorescent whitening agents (FWA), including three polar (anionic) FWA's used in U.S. laundry detergents and a nonionic FWA not now used in U.S. products, caused no acutely toxic effects to the bluegill. None of the three anionic FWA's (sulfonated stilbene derivatives) accumulated in the two fish species tested. The nonionic FWA did accumulate but was rapidly eliminated when fish were transferred to FWA-free water. Reported differences in accumulation between compounds within the same chemical class suggests that the chemicals be assessed per se rather than in broad categories.

Anon
CHLORINATED SOLVENT HANDLING
Text. Chem. Color. 7 (2): 50 (1975)

The handling, typical properties and toxicology of perchloroethylene, trichloroethylene, and 1,1,1-trichloroethane solvents are described in a 14-page illustrated manual available from PPG Industries.

*14-0031
PHTHALATES

Anon
NEW G-P PLASTICIZER HELPS EASE THE SUPPLY SQUEEZE
Mod. Plast. 52 (2): 21 (1975)

Eastman Chemical Products has introduced a new general-purpose, low volatility plasticizer for PVC, called Kodaflex DOTP, which is a derivative of 2-ethylhexanol and terephthalic acid. A table compares plasticizer properties of the DOTP with DOP and DIDP in PVC.

PHTHALATES

See also: 14-0035, Vinyl Chloride

See also: 14-0044, General Information

Utidjian, H. Michael D.
CRITERIA DOCUMENTS. EXCERPTS FROM CRITERIA FOR A RECOMMENDED STANDARD. . . OCCUPATIONAL EXPOSURE TO TRICHLOROETHYLENE. 1. RECOMMENDATIONS FOR A TRICHLOROETHYLENE STANDARD
J. Occup. Med. 16 (3): 192-4 (1974)

Brief review of Section 1, Environmental (workplace air), plus discussion of biological evaluation from Part IV, Environmental Data and Biologic Evaluation. (See also: CATS 4-0034)

TRICHLOROETHYLENE

See: 14-0030, Perchloroethylene

14-0033
SHALE OIL EXTRACTION AND REFINING

Anon
INTERIOR SEES ADEQUATE WATER FOR WESTERN COAL, OIL SHALE DEVELOPMENT
Land and the Environ. 3 (3): 21 (Feb. 7, 1975)

Recent reports from the Interior Department assure adequate water supplies for coal development plans along the Upper Missouri River Basin, and indicate that oil shale development in northwestern Colorado should not adversely affect water quality or quantity in that area. A study of the Northern Great Plains indicates that in oil shale development ground water use will impair water quality and limit some future land uses. These effects can be minimized, however.

14-0034
SHALE OIL EXTRACTION AND REFINING

Iammartino, Nicholas R.
TAR-SAND PROJECTS STUCK
Chem. Eng. 82 (4): 44,46,48 (Feb. 17, 1975)

Exploitation of Canada's tar sands to extract synthetic crude oil will not be economically feasible before 1980. One plant, Great Canadian Oil Sands Ltd., realized a profit in 1974, its first since production began in 1967, but four newer plant proposals are being abandoned or deferred. Large-scale working of Canadian reserves may have to wait for in situ recovery methods.

U.S. tar-sand reserves, approximately 30-35 billion bbl, mostly in Utah, are largely untouched.

14-0035
VINYL CHLORIDE

Anon
MEAT WRAPPER ASTHMA TIED TO LABEL FUMES
Chem. Eng. News 53 (8): 6-7 (Feb. 24, 1975)

Vinyl chloride may not be the real culprit causing asthma in meat-wrapping personnel. A recent study at the Univ. of Oregon Health Science Center, Portland, indicates that the adhesives in price labels may yield the fumes causing the asthma symptoms. The adhesive backings contain various elastomers, thermoplastic copolymers, polysulfones, phthalic acid plasticizers and other components.

14-0036
VINYL CHLORIDE

Ravey (Rogozinski), M. et al
MECHANISM OF VINYL CHLORIDE POLYMERIZATION
J. Polym. Sci. (Polym. Chem. Ed.) 12 (12): 2821-43 (1974)

The kinetic and mechanism of suspension polymerization of vinyl chloride are discussed under five process stages, each presenting a unique environment for the interaction of the systems parameters.

14-0037
VINYL CHLORIDE

Chang, E.P. and Salovey, R.
PYROLYSIS OF POLY(VINYL CHLORIDE)
J. Polym. Sci. (Polym. Chem. Ed.) 12 (12): 2927-41 (1974)

The thermal degradation of PVC polymerized at different temperatures was investigated using a pyrolysis-gas chromatography-mass spectrometric method. HCl is the major inorganic volatile evolved; benzene, the major organic volatile.

14-0038
VINYL CHLORIDE

Anon
COURT UPHOLDS VINYL CHLORIDE REGULATIONS
Chem. Eng. News 53 (6): 5-6 (Feb. 10, 1975)

A U.S. court of appeals denied an industry petition to void federal regulations for low occupational exposure level for vinyl chloride, setting April 1 as the effective date for the new regulations.

14-0039
VINYL CHLORIDE

Brown, Royal A.
THE TECHNICAL IMPACT OF GOVERNMENT REGULATIONS
J. Paint Technol. 47 (600): 69-73 (Jan. 1975)

Government agencies must bear the responsibility for assessing the socio-economic impact of any new regulations that they impose on industry. The technical impact of air and water pollution control regulations and regulations governing hazardous materials are discussed from the viewpoint of the coatings industry. The restrictive effect on industry of most government regulations is illustrated by a brief review of the vinyl chloride issue.

14-0040
VINYL CHLORIDE

Anon
FINAL DATA FROM MRI RESEARCH CONFIRM PLASTICS' ENVIRONMENTAL SUPERIORITY
Mod. Plast. 52 (2): 12, 14 (1975)

A report from Midwest Research Institute, "Resource and Environmental Profile Analysis of Plastics and Nonplastics Containers," shows plastics packaging (PVC, LDPE, ABS, HDPE) to be environmentally superior to glass, paper, and metal packaging. Method of determining the environmental impact index number is described.

14-0041
VINYL CHLORIDE
(Uses)

Anon
IN THE PIPE LINE: LOTS OF NEW OPTIONS IN THERMOPLASTICS
Mod. Plast. 52 (2): 42-5 (1975)

A review of developments in the million-metric-ton thermoplastics pipe and tubing business shows that for foam pipe current emphasis is on PVC. Other promising candidates are ABS and PE.

Table shows the consumption (1974, 1975, and 1980) for PVC, ABS, PE, and "other" plastics for various pipe markets.

14-0042
VINYL CHLORIDE

Carpenter, Ben H.
VINYL CHLORIDE. AN ASSESSMENT OF EMISSIONS CONTROL TECHNIQUES AND COSTS
Research Triangle Inst., Durham, N.C. (Sept. 1974). EPA/650/2-74-097.
PB-237 343/9WK

The report gives results of a survey of conceptual techniques applicable to vinyl chloride monomer (VCM) emission reduction with respect to VC monomer and polymer production. VCM emission points have been identified and quantified for four types of monomer plants -- hydrochlorination of acetylene, chlorination/oxychlorination of ethylene (with oxygen) and dehydrochlorination, and direct chlorination of ethylene and dehydrochlorination -- and four types of polymer manufacture--suspension polymerization, emulsion polymerization, bulk polymerization, and solution polymerization. Levels of control achievable and estimated cost of listed control techniques are presented.

[Abstract in: NTIS Weekly Govt. Abstracts, p. 57 (Feb. 10, 1975)]

See: 14-0001, Acrylonitrile

14-0002, Acrylonitrile

14-0011, Flame Retardants

*14-0031, Phthalates

Anon
COATED PAPER WRAPS UP A MARKET
Chem. Wk. 116 (8): 18-19 (Feb. 19, 1975)

Recent aluminum shortages spurred search for substitutes for foil-laminate packaging materials. Surtech Coating Co. announces multicoated paper materials that perform as well as aluminum-foil laminates at a lower cost. Surtech's process makes possible application of up to five coatings in a single run, on either or both sides of the substrate. For cereal packaging, Surtech is promoting a glassine substrate coated on both surfaces with saran -- polyvinylidene chloride -- and overcoated with a blended wax for good barrier properties.

VINYLIDENE CHLORIDE

See: 14-0011, Flame Retardants

14-0044
GENERAL INFORMATION

Cox, Geraldine V.
THE DAVY JONES GARBAGE DUMP
Environ. Sci. Technol. 9 (2): 108-11 (1975)

Review of regulations for ocean dumping, ocean dumping sites, ocean dumping criteria, and types of ocean dumping permits. Among the strictly regulated materials are arsenic, phthalate esters, plastics, and plastic intermediates.

14-0045
GENERAL INFORMATION

Drake, John W. (Chairman)
ENVIRONMENTAL MUTAGENIC HAZARDS
Science 187 (4176): 503-14 (Feb. 14, 1975)

Mutagenicity screening is now feasible and necessary for chemicals entering the environment, according to this report by Committee 17, Council of the Environmental Mutagen Society. Covers such topics as screening systems for environmental mutagens, characteristics of the ideal screening system and of currently used screening systems, risk analysis, and regulatory principles.

14-0046
GENERAL INFORMATION

Davavin, I.A. et al
INFLUENCE OF OIL ON NUCLEIC ACIDS OF ALGAE
Mar. Pollut. Bull. 6 (1): 13-15 (1975)

Knowledge is readily available on the grosser effects of petroleum hydrocarbons on organisms but there is a scarcity of information on the more subtle effects of oil. The conclusions from this study on algae indicate that oil inhibits biosynthesis of DNA and RNA and modifies the degree of polymerization of deoxyribonucleic acids.

14-0047
GENERAL INFORMATION

Anon
WILL CHEMICALS GET A SATISFACTORY BILL OF HEALTH?
Chem. Wk. 116 (7): 23-4 (Feb. 12. 1975)

Industry expects to have to meet increasingly stringent regulations to insure the health safety of employees, anticipates that Congress will pass a new toxic substances control bill tougher than last year's bill that was not passed. Meanwhile, OSHA is working to issue worker exposure standards for more than 400 chemicals in the next three years. Comment is made that if the tough toxic substances control bill that died in Congress last year had been in effect earlier, the $3 billion/year vinyl chloride business could never have been developed.

14-0048
GENERAL INFORMATION

Anon
SCIENTISTS DEBATE POLLUTANT THRESHOLDS
Chem. Wk. 116 (8): 27 (Feb. 19, 1975)

Scientists are generally of the opinion that levels of chemical exposure exist that are safe for human health, but are plagued by a variety of complications that make it difficult to determine these levels.

14-0049
GENERAL INFORMATION

Anon
PRODUCERS OF ADHESIVE POLYMERS AND SOLVENTS ARE THREATENED. . .
Chem. Wk. 116 (7): 31 (Feb. 12, 1975)

Increasing legislation against solvent-based adhesives may cut a big market from producers of adhesive polymers and solvents. North Americans and Europeans used 280 million gallons of solvent-based adhesive formulations in 1974. Market loss will affect producers of 196 million gal of organic solvents and 629 million lbs of dry adhesive polymers.

14-0050
GENERAL INFORMATION

Brooker, M.P. and Edwards, R.W.
AQUATIC HERBICIDES AND THE CONTROL OF WATER WEEDS
Water Res. 9 (1): 1-15 (1975)

Two types of effects follow from the use of herbicides for the control of aquatic plants: 1) the direct effects of the toxic action of the herbicide on aquatic organisms, and on terrestrial organisms after water abstraction; and 2) the indirect effects on the treated water body after the plants die. These effects are detailed.

14-0051
GENERAL INFORMATION

Badr, F.M. and Badr, Ragaa S.
INDUCTION OF DOMINANT LETHAL MUTATION IN MALE MICE BY ETHYL ALCOHOL
Nature 253 (5487): 134-6 (Jan. 10, 1975)

The long-time assumption that alcohol presents no genetic hazard seems to be disproved by these experiments using the dominant lethal technique; apparently in mice ethyl alcohol can be mutagenic under certain conditions.

Anon
THE U.S. COURT OF APPEALS HAS SET ASIDE. . .
Chem. Eng. News 53 (5): 7 (Feb. 3, 1975)

Finding that EPA failed to show any significant health hazards traceable to lead in gasoline, the U.S. court of Appeals has set aside the agency's regulation under which refineries would have had to produce by 1 Jan. 1975 a gasoline containing only 1.7 grams of lead/gallon instead of the current 2.2 grams. Additionally, the regulations required a phasing out of lead gradually to a level of 0.05 g/gal. by 1 Jan. 1979.

Anon
VINYL CYANIDE IN THE SKY
Science News 107 (9): 137 (Mar. 1, 1975)

The Max Planck Institute for Radioastronomy in Bonn, West Germany, and the Commonwealth Scientific and Industrial Organization of Australia have both established the presence of a new compound through their observations of interstellar space. They discovered the presence of molecules with a carbon-carbon double bond and found vinyl cyanide (acrylonitrile) in the cloud studied.

15-0002
ARSENIC

Wood, J.M.
BIOLOGICAL CYCLES FOR TOXIC ELEMENTS IN THE ENVIRONMENT
Science 183 (4129): 1049-52 (Mar. 15, 1974)

Stating that current knowledge of the biological cycles of toxic elements permits predicting the behavior of other toxic elements in the environment, the author classifies toxic elements, from an environmental viewpoint, as: 1) non-critical, 2) toxic and relatively accessible, and 3) toxic, but very insoluble or rare.

Arsenic is assigned to Class 2, and a figure illustrates its biological cycle. Arsenic compounds are reduced and methylated by anaerobes, yielding methylarsine and trimethylarsine as extremely toxic volatile products. These arsines do, however, oxidize readily to less toxic products, such as cacodylic acid. This acid, however, reportedly is an intermediate in the synthesis of dimethyl arsine from arsenic salts. Reportedly, alkyl-arsenic compounds have accumulated in shellfish analyzed in Norway.

15-0003
ARSENIC

Zingaro, Ralph A. and Irgolic, Kurt J.
THE METHYLATION OF ARSENIC COMPOUNDS
Science 187 (4178): 765 (Feb. 28, 1975)

Commenting on J.M. Wood's article [See: CATS 15-0002] on the biological methylation of metals in the environment, the authors question Wood's use of the concept of formal oxidation numbers, using arsenic as an example, and caution that failure to recognize that oxidation numbers are artificial could lead to the unnecessary biological electron transport system.

15-0004
ARSENIC

Minear, Roger A.
ANALYTICAL TECHNIQUES FOR MEASURING AND MONITORING TRACE METALS
Amer. Water Works Assn. J. 67 (1): 9-14 (1975)

There are numerous methods for the analysis of trace metals in water and this review indicates those best adapted to automatic analysis and data processing and points up areas in the various systems which might effect the final results.

A table presents a survey of methods for trace-metal analysis. Sampling requirements are discussed.

Although there have been no repeated outbreaks of heavy metal poisoning via community water supplies, trace metals found in drinking water supplies may pose a potential problem. As an example, a recent USGS study of 720 stations showed 21% of the samples to have soluble arsenic in excess of 10 μg/1, and 4% to have soluble cadmium in excess of 10 μg/1.

15-0005
ARSENIC

Chemical Section, National Safety Council
ARSENIC AND ITS COMPOUNDS. Data Sheet 499, Revision A
Industrial Safety Data Sheets, National Safety Council, Chicago, Ill.

This revised data sheet covers the physical properties and uses of elemental arsenic, arsenicals, and arsine; provides storage and handling information, discusses hazards and precautions, and lists the threshold limit values established by the American Conference of Governmental Industrial Hygienists.

15-0006
ARSENIC

Uthe, John F.; et al
COMPARISON OF WET ASHING AND DRY ASHING FOR THE DETERMINATION OF ARSENIC IN MARINE ORGANISMS, USING METHYLATED ARSENICALS FOR STANDARDS
J. Ass. Offic. Anal. Chem. 57 (6): 1363-5 (Nov. 1974)

A new digestion mixture for wet-ashing of biological materials proved more effective in the recovery of total arsenic than the AOAC dry ash procedure. This oxidation method was catalyzed by vanadium pentoxide and employed sulfuric and nitric acids. A 6.3% increase in recovery of arsenic from shellfish and fish tissues was observed with this method.

15-0007
ARSENIC

Anon
ARSENIC STANDARDS ARE RIDICULOUS
Chem. Wk. 116 (10): 39 (Mar. 5, 1975)

OSHA's proposed standards for exposure to arsenic (0.004 mg/m^3) came under criticism at the Conference on Health Effects of Occupational Lead and Arsenic held in Chicago recently. Kenneth Nelson of Asarco says that a number of epidemiological studies showed no difference in life expectancy among workers exposed to the substance, although Dow and Allied report high lung cancer rates among employees.

See: *15-0010, Asbestos

See also: 15-0060, General Information

*15-0008
ASBESTOS

Howard, W.P.
ASBESTOSIS (Letter to Editor)
Nature 253 (5490): 303 (Jan. 31, 1975)

Rebutting P.F. Holt's remarks [See: CATS *14-0006]re complacency over asbestosis, the author refers to Britain's latest Annual Report of HM Chief Inspector of Factories, which claims that new cases of asbestosis and mesothelioma and the latest figures do not reflect current conditions or knowledge about hazardous contamination levels of asbestos dust. A long-term medical environmental survey of 5000 asbestos workers and working zone measurements, shows that 92.6% of the dust counts were below the hygiene standard of two fibers/ml, reflecting industry's efforts to improve control standards.

*15-0009
ASBESTOS

Keller, Eugenia
WHAT IS HAPPENING TO OUR DRINKING WATER?
Chemistry 48 (2): 16-9 (1975)

Review of the contamination of drinking water raises questions of the possible effects of air pollutants dissolved in rain,airborne pollutants from spraying, and contaminants of surface water and groundwater. Author queries the possible effect in water of chlorofluorocarbons and polyvinyl chloride, and mentions the asbestos-fiber pollution of Lake Superior. Asbestos has caused cancer in humans, and the number of fibers ingested by a person drinking Lake Superior water for 15 to 17 years can equal those inhaled by workers during occupational exposure.

*15-0010
ASBESTOS

Carlson, Karen T.
THE PEOPLE'S LAKE
Environ. 17 (2): 16-20 (Mar. 1975)

Review and discussion of events since 1947, when Reserve Mining began using Lake Superior Water for separating taconite from rock, including trial proceedings initiated to prevent continuation of the procedure.

Main item of contention has been the presence of asbestos in the water, but article claims that the taconite tailings dumped into the water contain 35 chemicals, (including ammonia, arsenic, and mercury) many of which are toxic.

Reference is made to the potential carcinogenic effects of asbestos.

*15-0011
ASBESTOS

Eckardt, Robert E.
THE CARCINOGEN STANDARD OF THE NEW OCCUPATIONAL SAFETY AND HEALTH ACT
Bull. N.Y. Acad. Med. 50, 620-5 (1974)

Argument is advanced that the "Emergency Temporary Standard on Certain Carcinogens," published by the Dept. of Labor in the "Federal Register" of 3 May 1973 was written by individuals who lacked practical experience in industry and/or knowledge of carcinogens.

Of the 14 diverse chemicals listed by the standard as carcinogens, beta-naphthylamine is no longer produced in the U.S., 2-acetylaminofluorene is produced in small amounts for laboratory experiments, and alpha-naphthylamine is generally considered to be non-carcinogenic because of current manufacturing processes, which eliminate contamination of the alpha compound by beta-naphthylamine.

Known occupational carcinogens having an assigned TLV include asbestos, bis(chloromethyl) ether, chromates, coal-tar pitch volatiles, and nickel carbonyl. Potential occupational carcinogens without an assigned TLV include 4-aminodiphenyl benzidine and its salts, beta-naphthylamine, and 4-nitrodiphenyl. Substances with high potency for inducing tumors in experimental animals include 2-acetylaminofluorene, beryllium, chloromethyl-methyl ether, 3,3'-dichlorobenzidine, ethyleneimine, 4,4'-methylenebis(2-chloroaniniline), and beta-propiolactone.

*15-0012
ASBESTOS

Anon
ASBESTOS PROPERTIES AND MESOTHELIOMA PRODUCTION
Food Cosmet. Toxicol. 12 (4): 591-2 (Aug. 1974)

Reviews briefly two earlier reports: M.F. Stanton and C. Wrench, "Mechanisms of Mesothelioma Induction with Asbestos and Fibrous Glass [J. Natn. Cancer Inst. 48: 797 (1972)], and J.C. Wagner et al, "Mesothelioma in Rats after Inoculation with Asbestos and Other Materials," [Br. J. Cancer 28: 173 (1973)].

15-0013
BENZIDINE

Bunton, C.A. and Rubin, R.J.
MICELLAR CATALYSIS OF THE BENZIDINE REARRANGEMENT
Tetrahedron Letters No.1: 55-8 (Jan. 1975)

Previous studies show that anionic micelles accelerate specific hydrogen in catalyzed reactions, but most information relates to hydrolyses. The authors report a very large rate enhancement of the benzidine rearrangement of 1,2-diphenyl hydrazine by anionic micelles of sodium lauryl sulfate.

15-0014
BENZIDINE

Bunton, C.A. and Rubin, R.J.
BENZIDINE REARRANGEMENTS IN MODERATELY CONCENTRATED AQUEOUS ACID
Tetrahedon Letters No.1: 59-62 (Jan. 1975)

Acid catalyzed benzidine rearrangement, usually followed in aqueous organic solvents, is now studied in moderately concentrated aqueous acid. Studies involved the rearrangement of 1,2-diphenylhydrazine.

See: *15-0011, Asbestos

15-0015
BORON

Goldman, E. et al
A MODIFIED CURCUMIN METHOD FOR DETERMINING TRACE AMOUNTS OF BORON
Amer. Water Works Ass. J. 67 (1): 14-19 (1975)

The evaporation step which is usually followed in the standard curcumin method has been eliminated without impairing efficiency. An initial extraction procedure cuts down nitrates and hardening agents which makes this method useful for determining boron in hard water down to a level of 0.25 - 1.00 mg/1.

15-0016
BORON

Dyrssen, D.W. and Uppstrom, L.R.
THE BORON/CHLORINITY RATIO IN BALTIC SEA WATER
Ambio 3 (1): 44-6 (1974)

At the University of Gothenburg, an intensive investigation of the boron/chlorinity ratio in the Baltic Sea was carried out from 1967-1972. Results showed that, in spite of increased loads, the boron content had declined. Possible reasons are discussed. Boron is an integral part of the biocycle because it is essential for the life of plants and algae.

Babish, J.G. et al
LIVER CHANGES AND TISSUE RESIDUES OF ANIMALS FED HEXABROMOBIPHENYL
Abstract of paper to be presented at Federation of American Societies for Experimental Biology, 59th Annual Meeting, Atlantic City, New Jersey, April 13-18, 1975

PB-6, a commercial polybrominated biphenyl, was fed to Japanese quail for 9 weeks at 10, 20, and 100 ppm. Egg production and hatchability were depressed as a result. A milking cow was fed 50 ppm for 14 days and the PB-6 was evidenced in the milk within 24 hours and remained in the milk 14 days after withdrawals from feed. After slaughter, examination of the organs indicated toxic response in the liver, bile ducts and kidneys. [Abstract in: Fed. Proc. 34 (3): 246 (March 1, 1975)]

See: *15-0011, Asbestos

See: *15-0011, Asbestos

15-0018
FLAME RETARDANTS

Richardson, Byron L.
ARE FINISHERS QUITTING ON FLAMMABILITY?
Text. World 125 (2): 59, 61-2, 64, 71-2 (1975)

Delineates the problems of textile finishers in meeting flame-retardant standards (in California). Choice is between the use of chemicals with many side-effect problems or the more expensive flame-retardant fiber route.

Some of the many flame retardant chemicals are discussed as are the problems of application. During 1973 little significant progress was made in flame-retardant chemicals.

15-0019
FLAME RETARDANTS

Anon
FLAME-RETARDANT CHEMICALS IN 1975
Text. World 125 (2): 73-7, 82, 84, 86-9 (1975)

Chart provides information on flame retardants to meet end-use needs. Includes manufacturer, product name and form, chemical nature, fibers treated, end use, cost, applicable standards, etc.

15-0020
FLAME RETARDANTS

Anon
GROWTH WILL BE RETARDED
Chem. Wk. 116 (10): 14 (Mar. 5, 1975)

At the Conference of the Fire Retardant Chemicals Association, industry spokesmen expressed their views on areas which would affect the market for fire-retardant chemicals. New Federal regulations were not foreseen but the proliferation of differing regulations from state to state may hinder FR sales growth.

15-0021
FLAME RETARDANTS

Anon
SALES OFF FOR TEXTILE FIRE RETARDANTS
Chem. Eng. News 53 (9): 10-11 (Mar. 3, 1975)

Boom in fire-retardant chemicals over last four years with current sales down perhaps 50%. Signs of market recovery coupled with the fact that new regulations will push FR's into more clothing areas indicate sales growth by years end.

Mischutin, Vladimir
A NEW FR SYSTEM FOR SYNTHETIC/CELLULOSIC BLENDS
Text. Chem. Color. 7 (3): 40/21-42/23 (1975)

New development work on fire retardant processes for polyester/cellulosic blends has produced a unique system which meets government standards. Toxicological tests on the major component, a brominated cyclic compound, selected for the flame retardant finish showed it to be completely safe for use on apparel fabrics.

FLAME RETARDANTS

See: 15-0017, Brominated biphenyls

See also: 15-0043, Polyurethanes

*15-0023
FLUOROCARBONS

Chang, Louis W.
ULTRASTRUCTURAL CHANGES IN THE KIDNEY FOLLOWING CHRONIC EXPOSURE TO LOW LEVELS OF HALOTHANE
Amer. J. Pathol. 78 (2): 225-42 (1975)

Rats exposed to 10 ppm levels of haloethane for 8 weeks manifested chronic degenerative changes in the kidney, those exposed to 500 ppm for 4 weeks showed more extensive and exaggerated kidney damage. These effects indicate that haloethane is nephrotoxic and may be considered an occupational hazard.

*15-0024
FLUOROCARBONS

Maraschin, N.J. et al
SYNTHESIS OF STRUCTURALLY UNUSUAL FLUOROCARBONS BY DIRECT FLUORINATION
J. Amer. Chem. Soc. 97 (3): 513-7 (Feb. 5, 1975)

Structurally analagous perfluorocarbons were obtained by direct fluorination of neopentane, hexamethylethane, norbornane, a damantane and other related compounds.

See: *15-0011, Asbestos

*15-0025
FLUOROCARBONS

Wilkniss, P.E. et al
TRICHLOROFLUOROMETHANE IN THE TROPOSPHERE, DISTRIBUTION AND INCREASE, 1971 TO 1974
Science 187 (4179): 832-4 (Mar. 7, 1975)

In this study of trichlorofluoremethane (CCl_3F), the Naval Research Laboratory found that the increase in the troposphere for the years studied was proportional to the increase of industrially produced CCl_3F.

*15-0026
FLUOROCARBONS

Charlesworth, F.A.
CARDIAC RESPONSES TO FLUOROCARBON PROPELLANTS
Food, Cosmet. Toxicol. 12 (4): 552-5 (Aug. 1974)

In the light of a continuing controversy over the safety of fluorocarbon propellants, some 10 or more previous studies on various fluorocarbons are reviewed briefly. Fluorocarbon cardiotoxicity is still debatable, but the conclusion seems to be that from an industrial and medical standpoint fluorocarbons should not be a hazard, if they are used according to instructions and with regard to specified restrictions on exposure.

Good, William O. et al
SPUTUM CYTOLOGY AMONG FREQUENT USERS OF PRESSURIZED SPRAY CANS
Cancer Res. 35: 316-21 (Feb. 1975)

A group of private patients who had no respiratory symptoms were used in a study of the affect of aerosols generated by pressurized cans. Sputum samples revealed an excess of moderate and marked atypical metaplastic cells as compared with the control group. This strongly suggests that additional studies be done on aerosol can ingredients.

FLUOROCARBONS

See: *15-0009, Asbestos

15-0028
HALOETHERS

Anon
TEXTILE FINISHING OPERATIONS MAY POSE A CHEMICAL HAZARD...
Chem. Eng. News 53 (9): 19 (Mar. 3, 1975)

Studies made by the National Institute for Occupational Safety and Health and member companies of the American Textile Manufacturers Institute showed that traces of bis(chloromethyl)ether formed in textile finishing operations when formaldehyde resins were used in the presence of chlorides. This haloether is a known carcinogen.

15-0029
HALOETHERS

Drake, J.J.-P.
QUESTIONS OF HALOETHER CARCINOGENICITY
Food.Cosmet. Toxicol. 12 (4): 551-2 (Aug. 1974)

Summarizes briefly 10 previous reports on the potential carcinogenicity in humans and animals of the widely used industrial α-haloethers, chloromethyl methyl ether (CMME) and bis (chloromethyl) ether (BCME). Suggests need for carefully designed and monitored epidemiological studies with these compounds.

15-0030
HALOETHERS

Drew, Robert T. et al
INHALATION CARCINOGENICITY OF ALPHA HALO ETHERS. I. THE ACUTE INHALATION TOXICITY OF CHLOROMETHYL METHYL ETHER AND BIS(CHLOROMETHYL)ETHER.
Arch. Environ. Health 30 (2). 61-9 (1975)

Inhalation toxicity studies on chloronethyl methyl ether (CMME) and bis(chloromethyl) ether (BCME) resulted in acute irritation of the respiratory tract for both rats and hamsters. BCME was shown to be carcinogenic in a rat after 3 exposures. A hamster had a nasal tumor after one exposure to one ppm of this compound. The LC_{50} for rats inhaling CMME was 55 ppm and for hamsters 65 ppm. The LC_{50} for BCME was 7 ppm for both rats and hamsters. Both compounds caused severe shortening of rat life span after 30 days exposure.

15-0031
HALOETHERS

Laskin, Sidney et al
INHALATION CARCINOGENICITY OF ALPHA HALO ETHERS. II. CHRONIC INHALATION STUDIES WITH CHLOROMETHYL METHYL ETHER.
Arch. Environ. Health 30 (2): 70-2 (1975)

Ninety hamsters and 74 rats were exposed for 5 days a week throughout their life time for a period of six hours/day to a concentration of one ppm of chloromethyl methyl ether. Two of the rats were found to have malignant tumors in the respiratory tract. One hamster had a lung cancer, another had a malignant growth on the trachea.

Kuschner, Marvin et al
INHALATION CARCINOGENICITY OF ALPHA HALO ETHERS. III. LIFETIME AND LIMITED PERIOD INHALATION STUDIES WITH BIS(CHLOROMETHYL)ETHER AT 0.1 PPM.
Arch. Environ. Health 30 (2): 73-7 (1975)

Seventy rats and 100 hamsters were subjected throughout their lifetime to 0.1 ppm bis(chloromethyl) ether, 6 hr/day, 5 days/week. Only 57% of the rats survived exposure beyond 80 days. A second study involved 100 rats using the same concentration but with a specific number of exposures -- 10, 20, 40, 60, 80, and 100.

In the 200 rats studied, 40 cancers were found, 14 in the lung and 26 in the nasal cavity.

HALOETHERS

See: *15-0011, Asbestos

Khera, K.S.
TERATOGENICITY AND DOMINANT LETHAL STUDIES ON HEXACHLOROBENZENE IN RATS
Food Cosmet. Toxicol. 12 (4): 471-7 (Aug. 1974)

Pregnant rats were given single daily oral doses of hexachlorobenzene during the period of gestation. Maternal neurotoxicity and a reduction in foetal weight was caused when the dosage was 80 or 120 mg/hg. The incidence of 14th rib observed in the foetuses significantly increased when the dosage was taken during the later days of pregnancy. For the dominant lethal studies on male rats there was no significant difference between the control and test groups.

*15-0034
HYDRAZINE

Hawks, A. et al
MORPHOLOGICAL AND BIOCHEMICAL EFFECTS OF 1,2-DIMETHYLHYDRAZINE AND 1-METHYLHYDRAZINE IN RATS AND MICE
Brit. J. Cancer 30 (5): 429-39 (Nov. 1974)

Single doses of 1,2-dimethylhydrazine induced tumors in the kidney and colon in rats, and in mice tumors appeared in the anal margin and in the kidney. Changes in the liver were induced in both species. However, single doses of 1-methylhydrazine caused little change in the liver.

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*15-0035
HYDRAZINE

Reddy, Bandaru S. et al
COLON CARCINOGENESIS WITH AZOXYMETHANE AND DIMETHYLHYDRAZINE IN GERM-FREE RATS
Cancer Res. 35: 287-90 (Feb. 1975)

Conventional rats treated with a large dose of 1,2-dimethylhydrazine (DMH) developed neoplasms in the small intestine while germ-free rats did not. Ninety-three percent of the conventional rats tested exhibited DMH-induced colonic tumors while only 20% of the germ-free developed such tumors. Intestinal bacteria have been shown to play a modifying role in colon carcinogenesis induced by various chemicals.

See: 15-0013, Benzidine

See: 15-0014, Benzidine

15-0036
MODEL ECOSYSTEMS

Anon
MARINE MODELS WILL AID FUTURE RESEARCH
Science News 107: 108-9 (Feb. 22, 1975)

Marine biologists see marine animals playing an increasing role in environmental and biomedical research, indicating that useful information might be better obtained from studies of phylogenetically simpler organisms than from more complex mammals. Tumors found in marine animals of all phyla have been linked to oil spillage and other chemicals sources. Possibly, such tumors could be monitored to serve as "early warning devices" of carcinogenic water conditions.

15-0037
MODEL ECOSYSTEMS

Klechkovskii, V.M. et al (Eds.)
RADIOECOLOGY
Halsted (Wiley), New York, and Irael Program for Scientific Translations, Jerusalem, 1973 [Translated from the Russian edition (Moscow, 1971) by N. Kaner and H. Mills. , D. Greenberg, Transl. Ed.]

Collected papers in this book cover: radionuclide movement in terrestrial ecosystems, effects of ionizing radiation on terrestrial ecosystems, general radioecological aspects of terrestrial ecosystems, and the radioecology of aquatic ecosystems.

Many graphs and tables summarize the data, much of which on the ecology and chemistry of the marine and freshwater environments are excellent background for interpreting food chain transport and bioaccumulation of potentially hazardous radionuclides.

15-0038
MODEL ECOSYSTEMS

Smith, William H.
AIR POLLUTION--EFFECTS ON THE STRUCTURE AND FUNCTION OF THE TEMPERATE FOREST ECOSYSTEM
Environ. Pollut. 6 (2): 111-29 (1974)

The influence of air pollution on forest ecosystems in the temperate zones is discussed under three classes of relationship: Class I--under conditions of low dosage; Class II--under intermediate dosage; Class III--exposure to high dosage.

Although the many ecosystem impacts derived from air pollution stress have been identified, there is still insufficient knowledge to model or quantify the total impact of air pollution on forest ecosystems.

15-0039
MODEL ECOSYSTEMS

DiSalvo, Louis H. et al
TISSUE HYDROCARBON BURDEN OF MUSSELS AS POTENTIAL MONITOR OF ENVIRONMENTAL HYDROCARBON INSULT
Environ. Sci. Technol. 9 (3): 247-51 (1975)

Mussels proved to be efficient integrators of low level petroleum-derived hydrocarbon insult (ppb in water) and can serve as useful monitors of such pollution. A system designed particularly for rapid, semi-quantitative determination of tissue hydrocarbons is described and judged useful.

See also: 15-0050, General Information

See: *15-0011, Asbestos

Doig, Marion T. and Martin, Dean F.
A NOTE CONCERNING THE ENVIRONMENTAL ACCEPTABILITY OF NITRILO-TRIACETIC ACID (NTA): THE EFFECT OF NTA ON THE GROWTH OF GYMNODINIUM BREVE
Environ. Letters 6 (1): 31-6 (1974)

The presence of nitrilotriacetic acid, tested in natural waters or domestic waste water, did not prove to be toxic to the Florida red tide organism Gymnodinium breve and had no biostimulatory effects on this organism at concentrations up to 10 ppm.

Nielsen, Paul L. and Wicks, Zeno W., Jr.
EFFECT OF INTERNAL UV ABSORBERS ON PHOTODEGRADATION OF URETHANE COATINGS
J. Paint Technol. 47 (601): 30-5 (Feb. 1975)

To prevent yellowing of urethane coatings, UV absorbers (methacrylate derivatives of hydroxybenzophenones) were incorporated in the polymer. Yellowing was decreased and the internal UV absorbers appear more effective than external absorbers.

Anon
INFORMATION TO DEVELOP CRITERIA DOCUMENTS...
Chem. Eng. News 53 (9): 9 (Mar. 3, 1975)

The National Institute of Health is seeking information by 27 May 1975 for use in developing criteria documents from which to establish occupational exposure standards for acetylene, chlorine, ethylene dichloride, fluorine, formaldehyde, hydrogen fluoride, iospropanol, methanol, parathion (ethyl), phenol, phosgene, phosphine, phosphoric acid, phosphorus, tetrachloroethylene, and 1,1,1-trichloroethane.

Petajan, J.H. et al
EXTREME TOXICITY FROM COMBUSTION PRODUCTS OF A FIRE-RETARDED POLYURETHANE FOAM
Science 187 (4178): 742-4 (Feb. 28, 1975)

Laboratory tests indicate tha phosphate flame retardants added to rigid polyurethane foams may be extremely toxic during combustion of the foam products. Rats died after a few minutes exposure to the combustion products of the materials. This suggests the need for biological testing of flame retarded polyurethane foams.

POLYURETHANES

See: *15-0041, Optical Brighteners

See: *15-0005, Asbestos

15-0044
VINYL CHLORIDE

Funes-Cravioto, Francisco et al
CHROMOSOME ABERRATIONS IN WORKERS EXPOSED TO VINYL CHLORIDE
Lancet I (7904): 459 (Feb. 22, 1975)

Blood collected from seven male workers exposed to vinyl chloride and three non-exposed control workers from the same factory was analyzed for chromosomal aberrations. A table shows the chromosomal aberrations in workers exposed to vinyl chloride. The frequency of abnormal cells in this group (9.52%) was significantly greater than in the controls ($p<0.001$). This result held also for chromatid and isochromatid breaks when analyzed separately, but not for other types of aberrations.

15-0045
VINYL CHLORIDE

Popper, Hans
THE HEURISTIC IMPORTANCE OF ENVIRONMENTAL PATHOLOGY
Arch. Pathol. 99: 69-71 (Feb. 1975)

The discovery that vinyl chloride may produce unusual hepatic lesions has stimulated several study approaches in pathology and may well serve to advance various pathological concepts. The results may lead to the development of clinical parameters required to recognize incipient VC hepatic lesions for which available hepatic tests are not reliable.

Mention is made also of hepatic carcinomas in man from exposure to inorganic arsenicals and to thorium dioxide.

Gothe, R. et al
TRAPPING WITH 3,4-DICHLOROBENZENETHIOL OF REACTIVE METABOLITES FORMED IN VITRO FROM THE CARCINOGEN VINYL CHLORIDE
Ambio 3 (6): 234-6 (1974)

It has been suggested that the mutagenicity and carcinogenicity of vinyl chloride may be due to its reactive metabolites, formed via the microsomal detoxification system of the liver. This article illustrates the use of suitable thiols, particularly chlorine-containing aromatic thiols, for the detection of such metabolites. Vinyl chloride was metabolized *in vitro* and its metabolites were trapped by 3,4-dichlorobenzenethiol. These metabolites were then identified by a combined gas chromatography-mass spectrometry method.

See: *15-0009, Asbestos

See: *15-0027, Fluorocarbons

15-0047
GENERAL INFORMATION

Wong, P.T.S. et al
METHYLATION OF LEAD IN THE ENVIRONMENT
Nature 253 (5489): 263-4 (Jan. 24, 1975)

In general, the fate in the environment of lead, one of the most toxic metals, is unknown. There is, for example, no information on the existence of organic forms of lead in the environment as a result of biotransformation.

This study reports that microorganisms in lake sediments are able to transform certain inorganic and organic lead compounds into a volatile tetramethyl lead (Me_4Pb). The conversion is purely a biological process.

15-0048
GENERAL INFORMATION

Anon
THE BLUE HAZE EMITTED BY PLYWOOD MILLS COULD BE A SOURCE OF CHEMICALS...
Chem. Wk. 116 (9): 41 (Feb. 26, 1975)

Equipment for recovering the lignin-containing material emitted as a blue haze, from plywood veneer dryers has been developed by Georgia Pacific. At present, the tar-like recovered waste is being used as a fuel supplement, but other uses are being considered.

15-0049
GENERAL INFORMATION

Anon
CHLOROPRENE IS DRAWING MORE AND MORE ATTENTION AS A POSSIBLE CARCINOGEN
Chem. Eng. 82 (15): 74 (Mar. 3, 1975)

DuPont and Petro-Tex Chemical Company now have biological studies under way to investigate the hazards of exposure to chloroprene. These two companies are the main manufacturers of this compound. Dr. John Zapp, Jr., of DuPont notified NIOSH about chloroprene's similarity to vinyl chloride. National Cancer Institute will also assay this substance, which has been reported as a carcinogen by Soviet researchers.

15-0050
GENERAL INFORMATION

Anon
DEEP-SEA MINING ECOLOGICAL DISTURBANCE
Environ. Rept. 5 (20): 160 (Feb. 24, 1975)

National Oceanic and Atmospheric Administration reports that deep-sea mining could destroy bottom organisms and disturb surface and subsurface ecosystems. The mixing of bottom nutrients with surface waters will change the natural ecological balance of marine life. Possible effects could be the exposure of phytoplankton, the base of the biological food chain, to trace-metal contamination. This could interfere with the life-sustaining process of photosynthesis. An opposite, beneficial effect could be a phytoplankton "bloom," leading to more food for larger organisms and increased fish populations.

15-0051
GENERAL INFORMATION

Anon
PARTICULATE POLLUTION DAMAGES LUNGS
Environ. Reporter, p. 1278 (Dec. 15, 1974)

Lung tests were run on elementary school children from a high-particulate pollution area, Birmingham, Alabama, and a low-particulate pollution city, Charlotte, North Carolina, to evaluate the effect of sulfates and other suspended particulates on the lungs. According to a report in Environment Reporter, p. 1278, 15 Dec 1974, children in the high-particulate area showed consistently lower lung volume measurements.

15-0052
GENERAL INFORMATION

Anon
DDT: GROWING PROBLEM IN THE OCEANS
Science News 107 (9): 136 (Mar. 1, 1975)

When the pesticide, DDT, is used about half of it immediately dissipates into the lower atmosphere. The part that stays in the soil vaporizes within 5 years. In the atmosphere, some DDT may be broken down by UV light but most of it precipitates, unbroken, into the oceans and land. Ocean fish have reportedly accumulated 200 ppm DDT in their tissues. Because worldwide use of DDT is increasing, although US use has dropped during the last 10 years, scientists are concerned about an "irreversible accumulation of toxins in the ocean."

15-0053
GENERAL INFORMATION

Phillips, Roger W.
PLASTIC FOOD? (Letter to Editor)
Chem. Eng. News 53 (9): 5 (Mar. 3, 1975)

Referring to a recent article on microencapsulated pesticides, the author raises questions on the potential toxicity, the residual levels, and the ultimate fate of the "spent" polyamide encapsulating material.

15-0054
GENERAL INFORMATION

Anon
ENVIRONMENTAL LAW--1974 STYLE
Environ. Sci. Technol. 9 (3): 194-5 (1975)

Brief review of the provisions and enforcement of the new Safe Drinking Water Act; includes compliance deadlines that must be met by EPA.

15-0055
GENERAL INFORMATION

Anon
CAUTION: AIR MAY BE HAZARDOUS TO HEALTH
Environ. Sci. Technol. 9 (3): 198-9 (1975)

Latest information on the impact of air pollution indicates that nation's health is still seriously in jeopardy. Cites 1970 costs of air pollution damage in U.S. and discusses briefly air pollution as a social disease, air pollutants, respiratory diseases, cardiovascular diseases, and effects of air pollutants on the central nervous system.

15-0056
GENERAL INFORMATION

Heller, Stephen R. et al
TRACE ORGANICS BY GC/MS
Environ. Sci. Technol. 9 (3): 210-13 (1975)

An automated system for gas chromatograph/mass spectrometer detection of pollutants employs a minicomputer in a search and match program.

15-0057
GENERAL INFORMATION

Phillips, Sidney L. and Mack, Dick A.
INSTRUMENTS FOR WATER QUALITY MEASUREMENTS
Environ. Sci. Technol. 9 (3): 214-20 (1975)

Review of instrumentation and monitoring systems available or under development to meet required water standards.

15-0058
GENERAL INFORMATION

Wolf, Philip C.
CONTINUOUS ACROSS-THE-STACK MEASUREMENT
Environ. Sci. Technol. 9 (3): 221-5 (1975)

Pollutant particules, both solid and liquid, can now be monitored by means of an optical device. Optical transmissometers, e.g., the Durag-Intertech type, continuously measure emissions from power plants, refineries, incinerators, chemical plants and other plants, and have even been installed on ships.

15-0059
GENERAL INFORMATION

Olson, Kenneth W. and Skogerboe, Rodney K.
IDENTIFICATION OF SOIL LEAD COMPOUNDS FROM AUTOMOTIVE SOURCES
Environ. Sci. Technol. 9 (3): 227-30 (1975)

X-ray powder diffraction was used to identify lead compounds in the soil. Gradient density and magnetic separation procedures were employed initially to prepare soil samples. Possible reasons are given to explain the fact that lead sulfate has been determined to be the principal constituent in soil.

15-0060
GENERAL INFORMATION

Axtmann, Robert C.
ENVIRONMENTAL IMPACT OF A GEOTHERMAL POWER PLANT
Science 187 (4179): 795-803 (Mar. 7, 1975)

Chemical and thermal effluents from a New Zealand geothermal power plant are described with consideration of their chemical, physical, and biological consequences.

Twenty-six chemical species and nine gases are identified. Of these, only arsenic, mercury, hydrogen sulfide, carbon dioxide, and silica seem to produce significant environmental effects.

16-0001
ACRYLONITRILE
(Production)

Anon
PROPYLENE SOLIDIFIES POSITION AS FEEDSTOCK
Chem. Eng. News 53 (10): 8-10 (March 10, 1975)

For the first time in over 20 years, the use of propylene in chemicals and plastics may decline in 1975 but consumption is expected to pick up in 1976. Supply is expected to meet demand in 1975 and propylene's low price works for demands. Factors governing its potential use/demand are discussed.

Acrylonitrile, a major propylene derivative, seems to be losing ground; demand for propylene to make acrylonitrile dropped 15% in 1974, is expected to drop a little more in 1975; may increase slowly in late 1975, but is not expected to top 1973 use of about 1.9 billion lb. until 1977 or later. Demand for acrylonitrile in fiber uses has dropped, largely because acrylic fibers are considered "premium" quality and are used in making more expensive garments.

16-0002
ARSENIC

Gibney, Ling-yee
TOXIC SUBSTANCES CONTROL BILL DRAWS DEBATE
Chem. Eng. News 53 (11): 12-3 (March 17, 1975)

Arsenic, asbestos, bis(chloromethyl) ether, and vinyl chloride were featured in Sen. John Tunney's arguments for passage of this year's Senate version of a proposed toxic substances control bill. The Senator argued that the deaths associated with these chemicals would not have occurred had such a bill been passed some 20 years ago.

Arguments for and against passage of the bill centered on its potential economic impact on industry; the potential costs in terms of health hazards; the cost of screening studies for toxicity, mutagenicity, teratogenicity; and the authority of EPA to stop sales of a potentially hazardous chemical without a court hearing.

16-0003
ARSENIC

Selby, L.A. et al
PUBLIC HEALTH HAZARDS ASSOCIATED WITH ARSENIC POISONING IN CATTLE
J. Amer. Vet. Med. Ass. 165 (11): 1010-14 (Dec. 1, 1974)

Recent deaths of cattle in Missouri were traced to arsenic residues, apparently derived from wastes dumped by a gasoline station, and to sodium arsenite, presumably from a herbicide used to spray pasture weeds. The potential health hazard to humans, who might eat meat from animals that survived acute arsenic poisoning or in which arsenic is not discovered in either antemortem or postmortem examination, is discussed.

Although elemental arsenic, per se, is not toxic, its inorganic salts and its organic compounds may be toxic. Toxicity is governed by the concentration and the form of arsenic.

16-0004
ARSENIC

Milham, Samuel, Jr. & Strong, Terrence
HUMAN ARSENIC EXPOSURE IN RELATION TO A COPPER SMELTER
Environ. Res. 7 (2): 176-82 (Apr. 1974)

Increased levels of arsenic in the hair and urine of children, who lived near a copper smelter in Tacoma, Washington, and levels of arsenic in vacuum cleaner dust were shown to be distance dependent. Inhalation was judged to be the usual exposure route for the children. An increased incidence of respiratory cancer among smelter workers, added to the above findings, resulted in company action to reduce arsenic emissions.

16-0005
ARSENIC

Anon
WATER SCARE MAY BOOST POLLUTION CLEANUP
Chem. Eng. 82 (6): 30,32 (Mar. 17, 1975)

With passage of the Safe Drinking Water Act of 1974, plus the Water Pollution Control Act of 1972, EPA has strong means to force reduction of some industrial pollutants quickly and on an expanded scale.

Benzidine and its salts are among materials established as toxic pollutants. Arsenic and asbestos are among materials to be examined as potential toxic pollutants. The new drinking-water act may spur the demise of deep well disposal of industrial wastes.

Anon
THE EVIDENCE POINTS TO ARSENIC
Chem. Wk. 116 (12): 37 (Mar. 19, 1975)

OSHA will begin hearings on April 8 on proposed standards for exposure to arsenic. Although the several research studies cited present conflicting evidence, the consensus is that arsenic is a lung carcinogen.

See: 16-0005, Arsenic

*16-0007
ASBESTOS

Werner, Kirk G.
ASBESTOS AND SILICATE POLLUTION (A BIBLIOGRAPHY WITH ABSTRACTS)
National Technical Information Service, Jan. 1975. 96 pp. NTIS/PS-75/019/OWK

All aspects of air and water pollution by asbestos, silica, silicates, and silicon dioxide are covered by this bibliography, including sources, control, detection, and effects on plants, animals, and humans (silicosis, asbestosis, and toxicity). The report contains 91 annotated references.

[Abstr. in: NTIS Weekly Gov't Abstracts. Chemistry. pp. 74-5 (Mar. 3, 1975)]

*16-0008
ASBESTOS

Miller, Albert et al
"NONSPECIFIC" INTERSTITIAL PULMONARY FIBROSIS
N.E. J. Medicine 292 (2): 91-3 (Jan. 9, 1975)

A case history is reported in which a patient with interstitial granulomas and fibrosis akin to sarcoidosis was examined by electron microscopy and x-ray diffraction techniques. A civil service clerk, the patient had a hobby of refinishing furniture. Electron microscopy revealed the presence of chrysotile asbestos fibers in his lung tissues. The recommendation is made that electron microscopy examination be used in diagnosing cases of "idiopathic" interstitial fibrosis, which may, in fact, be pneumoconioses.

*16-0009
ASBESTOS

Merchant, J.A. et al
THE HL-A SYSTEM IN ASBESTOS WORKERS
Brit. Med. J. 1 (5951): 189-91 (Jan. 25, 1975)

A pilot study of the HL-A system in 56 asbestos workers was initiated to assess inherited differences in susceptibility to asbestosis. Six of 10 asbestos workers with the W 27 antigen, which appeared more often among the workers than among a control group, showed definite radiographic evidence of asbestosis versus 13 of 46 without the W 27 antigen. Thus, pending confirmation, the W 27 antigen could be a useful means of determining enhanced susceptibility of tissue damage from asbestos dust.

*16-0010
ASBESTOS

Weill, Hans et al
LUNG FUNCTION CONSEQUENCES OF DUST EXPOSURE IN ASBESTOS CEMENT MANUFACTURING PLANTS
Arch. Environ. Health 30 (2): 88-97 (Feb. 1975)

Clinical, radiographic, lung function, and dust exposure data for 859 workers in two asbestos cement manufacturing plants were used to evaluate the health hazards from dust exposure in the industry. A dose-response relationship between indexes of dust and lung exposure is suggested. A threshold dust level was established for the industry (cumulative total dust exposure level equivalent to 200 fibers/year or 5 fibers/ml over a working lifetime of 40 years).

*16-0011
ASBESTOS

Whitwell, F. et al
A STUDY OF THE HISTOLOGICAL CELL TYPES OF LUNG CANCER IN WORKERS SUFFERING FROM ASBESTOSIS IN THE UNITED KINGDOM
Brit. J. Ind. Med. 31 (4): 298-303 (Oct. 1974)

Studies of the cell-type frequencies of lung cancer in asbestosis cases have provided such conflicting results as to necessitate this study. Death records of 197 persons were examined, and 97 cases (88 males, 9 females) with adequate postmortem tumor and lung tissues were evaluated. In 34% of the males, the most common lung cancer was adenocarcinoma. Smoking habits were not significantly different in patients with different cell-types of lung cancer. Depending on the area of the bronchial tree reached, cigarette smoke will cause squamos or oat-cell tumors in the more proximal parts, or adenocarcinomas in the distal parts. Asbestos dust, acting as a co-carcinogen with cigarette smoke, produces a maximum, multiplicative effect resulting in adenocarcinoma in the distal part of the respiratory tract.

*16-0012
ASBESTOS
(Production)

Anon
TEAMING UP TO SAVE JOBS
Chem. Wk. 116 (12): 21 (Mar. 19, 1975)

That Lowell, Vt., asbestos mine and mill, formerly owned by GAF, is now owned by its employees, the Vermont Asbestos Group. Financial backing, an "easy payment schedule" to GAF, and an EPA extension of the deadline for installing required equipment makes it possible for the new owners to continue working pits with an ore supply estimated to last for five or six years. New deposits will extend the mine life. The Lowell facility, one of the few asbestos mines in the U.S., will probably contribute 40% or more of domestic output in 1975.

*16-0015
ASBESTOS

Miller, Stan
INTERVIEW. NIEHS' DAVID RALL
Environ. Sci. Technol. 8 (13): 1065-8 (Dec. 1974)

The National Institute of Environmental Health Sciences (NIEHS), concerned with the effect of environment on public health, operates at a funding level of about $29 million. NIEHS supports, among other studies, the core research program at six environmental science research centers of which the newest, in the New York area, is concentrating on asbestos and vinyl chloride-polyvinyl chloride. Work is under the direction of Irving Selikoff.

*16-0016
ASBESTOS

Langer, Arthur M.
THE SUBJECT OF CONTINUOUS VIGILANCE
Environ. Health Perspect. 9: 53-6 (Dec. 1974)

Asbestos disease in the occupational setting has been documented since the beginning of this century. Modern usage of asbestos fiber has brought with it concomitant and widespread contamination of the environment. The need to control asbestos is required in the forms of legislation and surveillance, to prevent the spread of asbestos disease into the general population.

*16-0013
ASBESTOS

Whimster, W.F.
FOR THOSE IN PERIL
Nature 253(5492): 496 (Feb. 13, 1975)

The author raises the point that Peter J. Smith's statement that "asbestos products (and thousands of other equally or more dangerous substances) are here to stay," is a political statement and that others, who commented on Smith's report, failed to make a distinction between the scientific and political aspects of pollution.

Whimster feels that the public must be given intelligible information on the cost or risk of each pollutant and that the final decision on each should be based on "public opinion." "Unsound scientific or political activism could so limit industrial or daily activity that ill-health from pollutants could become replaced by poverty."

*16-0014
ASBESTOS

Schmidt, A.M.
ASBESTOS-FORM PARTICLES IN DRUGS FOR PARENTERAL INJECTION
Fed. Register 40 (51): 11865-9 (Mar. 14, 1975)

Comments on FDA's notice of 28 Sept. 1973 proposing to restrict the utilization of asbestos filters in the manufacture of parenteral drugs and their ingredients, and to prohibit the use of asbestos-containing talc as a food or drug ingredient or in food and drug packagings are presented. The notice was proposed because of potential hazards with the decision being based on the fact that asbestos fibers are known to cause cancer when inhaled in large amounts.

*16-0017
ASBESTOS

McCrone, Walter C.
DETECTION AND IDENTIFICATION OF ASBESTOS BY MICROSCOPICAL DISPERSION STAINING
Environ. Health Perspect. 9: 57-61 (Dec. 1974)

Asbestos fibers as small as 1 μm in diameter can be uniquely identified by light microscopy by employing dispersion staining methods. The technique described herein involves suspension of fibers in liquids of known refractive indices and observation of color display by means of a dispersion staining objective. Wavelengths or indices of refraction may be determined at right angles to and parallel to fiber axes. This method is rapid and sensitive for identification purposes.

*16-0018
ASBESTOS

Langer, Arthur M. et al
ELECTRON MICROSCOPICAL INVESTIGATION OF ASBESTOS FIBERS
Environ. Health Perspect. 9: 63-80 (Dec. 1974)

Examination of asbestos fibers by electron microscopical techniques enables the observer to distinguish among the fiber types by morphological and structural characteristics.

Chrysotile asbestos fibers are composed of bundles of fibrils. Fibers are often curvilinear with splayed ends. Individual fibrils consist of a central capillary defined by an electron dense crystalline wall. With increasing time of electron bombardment, the capillary wall decreases in thickness, deforms, and is encapsulated in an electron translucent material. The change in electron opacity is considered to be a product of structural disruption brought about by dehydroxylation due to electron radiation. A well recognized sequential deformation pattern may be used for identification purposes.

Amphibole fibers tend to be straight, splintery, and electron-opaque, although curved fibers are occasionally observed. Diffraction contrast figures are visible as dark bands moving parallel and at right angles to the fiber axis. Crocidolite forms the shortest and thinnest fibers, followed in size by amosite and anthophyllite. Size distribution characteristics of the amphibole fiber types are different.

The selected area electron diffraction pattern for chrysotile is unique. Reflections range in forms from streaked to arcuate. Reflection intensity and shape are related to the degree of openness of the fiber bundle and the extent of physical degradation of the fiber. The amphibole asbestos fibers possess diffraction patterns having similar characteristics prohibiting individual identification. Microchemical analysis is required for identification in such cases.

A discussion of the industrial hygiene threshold limit values for ampliphibole asbestos fibers is presented. The discussion is based on their differing size distribution characteristics.

*16-0019
ASBESTOS

Rubin, Ivan B and Maggiore, Carl J.
ELEMENTAL ANALYSIS OF ASBESTOS FIBERS BY MEANS OF ELECTRON PROBE TECHNIQUES
Environ. Health Perspect. 9: 81-94 (Dec. 1974)

The identification and characterization of microparticles has become an important field of study in recent years due to their presence in the environment and association with pathogenesis. Asbestos fibers have been intensively studied for these reasons. Since conventional microscopy has not provided unique identification of these materials, electron probe microanalysis, which yields chemical data, has been utilized in conjunction with other techniques to provide the necessary answers.

The options now available to undertake electron probe analysis are discussed with relation to their utilization for microparticle analyses. Two types of electron sources are available, thermionic and field emission. The x-ray spectroscopy requires the use of either wavelength-dispersive focussing crystal spectrometers or an energy-dispersive Si(Li) x-ray detector.

Data are presented to demonstrate the feasibility of asbestos identification by using modified raw data obtained with a scanning electron microscope and energy-dispersive x-ray spectrometer. Further, the extension of the technique to other microparticle identification problems is discussed.

*16-0020
ASBESTOS

Rohl, Arthur N. and Langer, Arthur M.
IDENTIFICATION AND QUANTITATION OF ASBESTOS IN TALC
Environ. Health Perspect. 9: 95-109 (Dec. 1974)

The currently used analytical methods for identification, characterization and quantitation of asbestos fiber in consumer talcum products include polarized light microscopy, x-ray diffraction analysis, transmission electron microscopy with selected area electron diffraction and electron microprobe techniques.

Light microscope methods have severe limitations imposed by the ultimate size resolution of the light-optical system. Small particles go unresolved; those marginally resolved may possess optical properties different from those properties cited in the literature; most optical properties, e.g., indices of refraction, are difficult to measure on small particles. In addition to these difficulties, talc fibers often possess optical properties different from those of talc plates, which further confound analysis. Light microscopy is recommended for use only as a preliminary tool on limited, large-sized, samples. Transmission electron microscopy is a good standard technique for visualization of contaminant asbestos fibers. Together with selected area electron diffraction, talc fibers may be easily differentiated from amphibole asbestos fibers on the basis of both morphological and structural characterization. Chrysotile fibers are easily distinguished on this basis as well. The amphibole asbestos minerals require chemical characterization to differentiate among the different fiber types. Probe analysis is mandatory for such fibers. The major drawbacks to electron beam instrumentation for the mineralogical characterization of talcum products are the time and effort required for data acquisition. These techniques do not lend themselves to routine study.

X-ray diffraction analysis, utilizing the step-scan method, offers a relatively rapid, quantitative technique for gross fiber analysis. Based on comparison with standard specimens the fiber content of talcs may be quantitatively determined. It is essential to employ a specimen preparation technique which yields homogeneously dispersed particles. Tremolite may be determined at levels as low as 0.10% by weight, chrysotile 0.25%, and anthophyllite at 2.0% by weight occurrence in talc. The variance of these values depends upon many factors, including the mass absorption coefficient of the fiber types as compared to talc and selected diagnostic reflections and their relative intensities.

Each of the above techniques is described in detail. A method for routine analysis of consumer talcum products is suggested.

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*16-0021
ASBESTOS

Lee, Douglas H.K.
BIOLOGICAL EFFECTS OF INGESTED ASBESTOS. PROCEEDINGS OF A JOINT NIEHS-EPA CONFERENCE, DURHAM, NORTH CAROLINA, NOVEMBER 8-20, 1973.
Environ. Health Perspect. 9: 113-338 (Dec. 1974)

Papers presented covered such topics as asbestos bodies and fibers in lung tissue, small animals in the study of pathological effects of asbestos, inorganic particles in human tissues and their association with neoplastic disease, cytotoxicity of heated chrysotile, epidemiology of gastrointestinal cancer, analytical methods, etc.

*16-0022
ASBESTOS

Lee, Douglas H.K.
BIOLOGICAL EFFECTS OF INGESTED ASBESTOS: REPORT AND COMMENTARY
Environ. Health Perspect. 9: 113-22 (Dec. 1974)

The recent extensive pollution of Lake Superior waters with asbestos from mine residue and the subsequent furor over public health consequences underscored the need for increased information on the biological effects of ingested asbestos and led to the promotion of a conference, sponsored by the National Institute of Environmental Health Sciences and the Environmental Protection Agency, in Durham, N. Carolina on Nov. 18-20, 1973. Conference papers covered the physical and chemical properties of asbestos fibers as well as their pathological potential.

*16-0023
ASBESTOS

Rose, Malcolm
GEOLOGY, ASBESTOS, AND HEALTH
Environ. Health Perspect. 9: 123-4 (Dec. 1974)

A brief discussion of three types of geologic occurrences of asbestos-like minerals is given. The problem of mining ore free of asbestos is considered.

*16-0024
ASBESTOS

Bowes, D.R.
IDENTIFICATION AND QUANTITATION OF MICROPARTICLES IN SOLID MATERIALS
Environ. Health Perspect. 9: 125-7 (Dec. 1974)

Variation in the precise conditions of geological formation may produce variations in the exact composition of asbestos minerals of a particular class, and thus in their biological interactions. Examples are given of differences in O^{3+}/O^{2+} ratios, TiO_2 content, lattice substitutions, substitution of Al (III) for Si (IV) and attachments to spare hydrostatic charges.

*16-0025
ASBESTOS

Rohl, Arthur N.
ASBESTOS IN TALC
Environ. Health Perspect. 9: 129-32 (Dec. 1974)

Talc deposits include asbestos minerals such as chrysotile and amphiboles that may be carried over into consumer products. Optical microscopy and x-ray diffraction analyses may not reveal their presence. Examples are given of electron microscopy procedures that permit detection and measurement.

*16-0026
ASBESTOS

Langer, Arthur M.
APPROACHES AND CONSTRAINTS TO IDENTIFICATION AND QUANTITATION OF ASBESTOS FIBERS
Environ. Health Perspect. 9: 133-6 (Dec. 1974)

Asbestos fibers, members of complex crystal-chemical systems, possess some range in characteristic properties. Identification of fibers requires morphological, structural, and chemical data. Most current work centers on identification of single, sublight-microscopic fibers present as contaminants in a range of media. Constraints encountered in the analysis of such materials are: sample preparation of the differing media; level of fiber exposure (contamination); presence (kind and amount) of other particles; tissue types and their different preparation techniques; homogeneity of samples and their preparations; use of proper instrumental technique; time required for analysis, and quantitation.

*16-0027
ASBESTOS

Konnert, J.H.
STRUCTURAL INFORMATION IN DIFFUSE DIFFRACTION PATTERNS
Environ. Health Perspect. 9: 137-8 (Dec. 1974)

The radiation diffraction pattern for amorphous materials requires special analysis for information on atomic groupings. Powdered crystalline material may also give diffuse patterns requiring this type of analysis. Absence of a sharp diffraction pattern does not necessarily indicate absence of the material. Examples are given for chrysotile and powdered chrysotile.

*16-0028
ASBESTOS

Pooley, Fred
MICROPARTICLES IN BIOLOGICAL TISSUES
Environ. Health Perspect. 9: 139 (Dec. 1974)

Brief discussion of an electron beam instrument of scanning or transmission type for investigation of microparticles, such as asbestos, in biological tissues.

*16-0029
ASBESTOS

Maggiore, Carl
MODES OF MICROSCOPY
Environ. Health Perspect. 9: 141-2 (Dec. 1974)

Review of optical microscopy, transmission electron microscopy, scanning electron microscopy and other methods as means of identifying material (such as asbestos) particle by particle.

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*16-0030
ASBESTOS

Eichen, Erwin
TWO INSTRUMENTS FOR FIBER IDENTIFICATION
Environ. Health Perspect. 9: 143-6 (Dec. 1974)

A scanning transmission energy analyzing microscope (STEAM) and an automated microprobe are described and their use explained. In the former instrument the image is scanned across an aperture and quantitative information recorded. In the latter the movement of the beam can be programmed and the x-ray data taken into storage.

*16-0031
ASBESTOS

Fondimare, A. and Desbordes, J.
ASBESTOS BODIES AND FIBERS IN LUNG TISSUES
Environ. Health Perspect. 9: 147-8 (Dec. 1974)

It is suggested that the ratio of asbestos bodies observable by light microscopy to asbestos fibers counted by electron microscopy be examined in a series of cases of asbestosis of varying severity. If the ratio is reasonably constant an estimate of fiber content could be made from the more easily conducted count of asbestos bodies by light microscopy.

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*16-0032
ASBESTOS

Le Bouffant, L.
INVESTIGATION AND ANALYSIS OF ASBESTOS FIBERS AND ACCOMPANYING MINERALS IN BIOLOGICAL MATERIALS
Environ. Health Perspect. 9: 149-53 (Dec. 1974)

A method is described for isolating asbestos fibers contained in biological tissues. It consists in incinerating the biological material in activated oxygen at 150°C, and attacking the ash by 1N HCl for 18 hr. The residue is then filtered on a membrane covered with a carbon film. Electron microscope examination of the deposit makes it possible to determine fiber concentrations when the weight or volume of primary material is known, and to make size analyses. By x-ray diffraction, the mineralogical nature of the asbestos is determined by comparison with an aluminum reference diagram. For x-ray diffraction, a micromethod is used, with an ash sample of about 10 µg.

These techniques are used for identifying and counting asbestos fibers in small fragments of lungs or other organs. It was found that asbestos fibers generally go along with other minerals which may be abundant. Most fibers found in lung are less than 3 µm long. Counts on lungs of asbestos workers give concentrations often greater than 10[illegible] particles per gram of dry tissue. The evolution of inhaled chrysotile seems to be different from that of amphiboles. In the case of pleural mesothelioma, a comparison of fibers within the tumor with fibers in the adjacent parenchyma shows only slight differences in the particle sizes, but marked differences in their nature, with a chrysotile enrichment in the pleural zone. Pleural plaques were analyzed in the same way. After decalcification, many small sized asbestos fibers were found. The same technique is now being used for determining ingested particles. A great number of observations concerning fiber counts, their nature and sizes, and the presence of various clays minerals will be necessary to establish the role of the different factors in the formation of lesions caused by the inhalation or the ingestion of asbestos fibers.

*16-0033
ASBESTOS

Bignon, J. et al
MICROFILTRATION METHOD FOR QUANTITATIVE STUDY OF FIBROUS PARTICLES IN BIOLOGICAL SPECIMENS
Environ. Health Perspect. 9: 155-60 (Dec. 1974)

Counting coated and uncoated inorganic fibers in sputum has been used to investigate the level of environmental or occupational asbestos exposure and the concentration of fibrous dusts in human lung. Inorganic fibers in sputum were counted by light microscopy after chemical digestion and microfiltration processing. The same method was used for processing gastric juice and lung tissue. There were no ferruginous bodies (FB) in sputum from 49 patients without any asbestos exposure.

The study of sputum from 125 patients with various asbestos exposure pointed out a high correlation between the number of FB in sputum and the level of asbestos exposure. These 125 patients were classified into three groups according to the type of their asbestos occupational hazard: group I, raw asbestos workers; group II, workers manufacturing asbestos products; group III, workers with mixed industrial dust exposure. For these three groups, the mean number of FB in sputum was 100, 10, and 1, respectively.

The comparison of the FB content of sputum and lung parenchyma showed the absence of FB in sputum when the concentration of FB in lung parenchyma was under $1000/cm^3$ of lung parenchyma; above this concentration the number of FB in sputum was in good correlation with fiber concentration in lung parenchyma. A preliminary study with the use of gastric juice showed that gastric juice is a less sensitive sample for evaluating fiber concentration in lung.

The microfiltration method for the counting of uncoated fibers gave results as accurate as those in the centrifugation method.

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*16-0034
ASBESTOS

Speil, Sidney
CHRYSOTILE IN WATER
Environ. Health Perspect. 9: 161-3 (Dec. 1974)

The problems of quantitating chrysotile in water by fiber count techniques are reviewed briefly and the use of mass quantitation is suggested as a preferable measure.

Chrysotile fiber has been found in almost every sample of natural water examined, but generally transmission electron miscroscopy (TEM) is required because of the small diameters involved. The extreme extrapolation required in mathematically converting a few fibers or fiber fragments under the TEM to the fiber content of a liquid sample casts considerable doubt on the validity of numbers used to compare chrysotile contents of different liquids.

*16-0035
ASBESTOS

Nicholson, William J.
ANALYSIS OF AMPHIBOLE ASBESTIFORM FIBERS IN MUNICIPAL WATER SUPPLIES
Environ. Health Perspect. 9: 165-72 (Dec. 1974)

Details are given of the techniques used in the analysis of asbestiform fibers in the water systems of Duluth, Minnesota and other cities. Photographic electron diffraction and electron microprobe analyses indicated that the concentration of verified amphibole mineral fibers ranged from 20×10^6 to 75×10^6 fibers/l. Approximately 50–60% of the fibers were in the cummingtonite-grunerite series and 20% were in the actinolite-tremolite series. About 5% were chemically identical with amosite. A wide variety of analytical techniques must be employed for unique identification of the mineral species present in water systems.

*16-0036
ASBESTOS

Whittemore, Donald O. and Langmuir, Donald
FERRIC OXYHYDROXIDE MICROPARTICLES IN WATER
Environ. Health Perspect. 9: 173-6 (Dec. 1974)

Mineralogy and specific surface area are major controls on the stabilities of ferric oxyhydroxide microparticles in natural waters. The thermodynamic stabilities of ferric oxyhydroxides, as described by the activity product in solution $pK = -\log[\mathrm{Fe}^{3+}][\mathrm{OH}^-]^3$ range from $pK = 37.1$ for freshly precipitated amorphous oxyhydroxide to $pK = 44.2$ for well crystallized goethite. The sizes of suspended oxyhydroxide particles in natural waters range from less than 0.01 μm to greater than 5 μm. Oxyhydroxides precipitated in the laboratory from solutions simulating high-iron natural waters are needlelike or lathlike in shape and have mean thicknesses as small as 60 Å. Large specific surface areas resulting from the small sizes of ferric oxyhydroxide particles cause increased solubilities and thus decreased pK values. Specific surface areas of 40–170 m^2/g determined for laboratory precipitates gave computed decreases in pK of 0.4 to 1.6 units.

One of many papers presented at NIEHS-EPA conference on "Biological Effects of Ingested Asbestos," Durham, N. Caroline, 18-20 Nov. 1973.

*16-0037
ASBESTOS

Biscaye, Pierre E.
DEEP SEA SEDIMENTATION
Environ. Health Perspect. 9: 177-8 (Dec. 1974)

An important problem in the study of microparticles in the marine environment, suspended in the water column or deposited as sediment on the ocean bottom, is the determination of provenance of the microparticles—where did they come from and by what processes were they transported to the sampling location? Two techniques of possible interest to those concerned with tracing the origins and dispersion paths of asbestos particles are described. One utilizes variations in the naturally occurring rubidium-strontium isotope system and is used to characterize a bulk sample, i.e., a large number of particles. The other utilizes scanning electron microscopy to observe variations in surface texture of individual grains which, in the case of quartz particles in the natural environment, can be related to the transport processes to which they have been subjected.

*16-0038
ASBESTOS

Goldberg, E.D.
MEASUREMENT OF POLLUTION HISTORY
Environ. Health Perspect. 9: 179-80 (Dec. 1974)

A technique to measure the history of pollution exposure levels in the environment, which has been applied to many coastal and lacustrine areas for measuring exposure levels of heavy metals and elemental carbon contaminants, was described at the NIEHS-EPA conference on "Biological Effects of Ingested Asbestos," Durham, N. Carolina, Nov. 18-20, 1973.

*16-0039
ASBESTOS

Everett, Gordon
ANALYSIS FOR ASBESTOS IN ENVIRONMENTAL SAMPLES
Environ. Health Perspect. 9: 181-2 (Dec. 1974)

Brief discussion of parameters (size distribution, magnification, etc.) that must be considered for accurate analysis of environmetal materials, such as asbestos. The large amount of chrysotile available in water systems necessarily will affect particle analyses in water.

*16-0040
ASBESTOS

Eisenberg, William V.
INORGANIC PARTICLE CONTENT OF FOODS AND DRUGS
Environ. Health Perspect. 9: 183-91 (Dec. 1974)

Inorganic particulate matter in foods and drugs is discussed from the standpoint of determination by optical microscopy, source, and regulatory significance. Some particulate matter may be generated as extraneous material and traced to specific operational practices during processing and production with excessive levels associated with deficiencies in good manufacturing practices. Other particles, such as talc and asbestos, may be incorporated as additives during their use in production. Data on particles in parenteral drugs are discussed generally. Specific data on glass particles in foods and sand and soil particles in spices are presented.

*16-0041
ASBESTOS

Kay, Kingsley
INORGANIC PARTICLES OF AGRICULTURAL ORIGIN
Environ. Health Perspect. 9: 193-5 (Dec. 1974)

Substantial quantities of mineral silicates are used as carriers for agricultural pest control agents. Most of this material is applied by air dissemination, either dry or as a droplet spray. Therefore, pulmonary and gastric deposition of the mineral carriers (and active agents) will occur among pesticide application personnel and some proportion of the general population in the vicinity of pest control operations—to the extent that particle size of the disseminated material is below the critical $5 \mu m$ respirable diameter. Furthermore, ingestion of particulates deposited on food crops may be expected as well as mineral finding its way into drinking water supplies. It has been found that the silicates widely used in America can contain three forms of asbestos, anthophyllite, tremolite, and chrysolite. Of these, anthophyllite and chrysotile have been found associated with a neoplastic outcome after many years of exposure. It is therefore proposed that comprehensive mineralogical investigation of pesticide carriers is warranted, including epidemiological and clinical study of formulation and application personnel as well as exposed nonoccupational populations.

*16-0042
ASBESTOS

Maggiore, Carl
MODES OF ASBESTOS DETECTION IN FOOD AND DRUGS
Environ. Health Perspect. 9: 197 (Dec. 1974)

Brief comment on the sources of contamination of food and drugs by asbestos, analytical techniques and monitoring.

*16-0043
ASBESTOS

Webster, I.
THE INGESTION OF ASBESTOS FIBERS
Environ. Health Perspect. 9: 199-202 (Dec. 1974)

Feeding of baboons with crocidolite showed small numbers of asbestos needles 0.5–1 μm in ashed tissue of the gut wall, which probably came from iron-containing macrophages. It is suggested that pleural plaques and hyaline nodules in the peritoneum represent a hypersensitivity reaction to ferritin protein coating on asbestos fibers. In South Africa only a few peritoneal mesotheliomas come from the asbestos areas, and the incidence of gastrointestinal carcinomas is no greater than normal. Intrapleural and intraperitoneal injection produces unrealistic situations.

Calcium salts are deposited on asbestos cement pipes from hard water and organic material from soft water. It is difficult to envisage asbestos contamination of the water so reticulated.

*16-0044
ASBESTOS

Brown, Arnold
LYMPHOHEMATOGENOUS SPREAD OF ASBESTOS
Environ. Health Perspect. 9: 203-4 (Dec. 1974)

Brief review of the effects of asbestos fibers on the lymph nodes.

*16-0045
ASBESTOS

Holt, Paul F.
SMALL ANIMALS IN THE STUDY OF PATHOLOGICAL EFFECTS OF ASBESTOS
Environ. Health Perspect. 9: 205-11 (Dec. 1974)

The main pathological effects attributed to asbestos are carcinogenesis and fibrogenesis. Statistical studies have shown that asbestos workers may expect a higher morbidity not only from cancer of the lung and mesothelioma but also from cancer at other sites. Carcinomas have been reported in animals following the injection of asbestos, but the production of carcinomas by inhaled asbestos is less easy to demonstrate; most examples of experimental carcinogenesis with asbestos have been produced in rats. Rats and man react differently to asbestos in that rats do not produce asbestos bodies.

The fibrosis that follows inhalation of asbestos has been frequently described, but studies with specific pathogen free animals have shown that, like the fibrosis that may follow the inhalation of silica dust, gross fibrosis involving the production of abnormal amount of collagen probably requires the intervention of infection as well as asbestos.

Because of the difficulties encountered in the direct investigation of carcinogenesis and fibrogenesis resulting from the inhalation of asbestos, attention has been directed to the mechanisms by which the lung is able to protect itself against these fibrous dusts. While nonfibrous dusts and short fibers can be ingested by macrophages and removed via the bronchus, the long fibers that may also reach the alveolar regions may not be removed by this mechanism. The probability that a fiber may reach the alveoli depends largely on the fiber diameter and only to a small extent on the fiber length, so that, for example, fibers 100 μm long may reach the alveoli of a guinea pig. These long fibers may become coated with a ferroprotein derived from hemoglobin to form an asbestos body and, after morphological changes, the asbestos body may be broken up, the fragments ingested by macrophages and dissolved. The lung is thus cleared of asbestos. In the guinea pig lung, consolidated areas from which the asbestos has disappeared shows signs of return to normal.

This clearance mechanism is inhibited by other factors: quartz dust may almost completely inhibit asbestos body formation; tobacco smoke has a considerable effect, and even very heavy loads of carbon may act similarly.

The normal lung appears able to efficiently eliminate small loads of both nonfibrous and fibrous dust, including the carcinogenic asbestos fibers. The capacity is not unlimited, however.

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*16-0046
ASBESTOS

Pontefract, R.D.
PENETRATION OF ASBESTOS THROUGH THE DIGESTIVE WALL IN RATS
Environ. Health Perspect. 9: 213-4 (1974)

Distribution studies on asbestos fibers administered to rats were performed with the electron microscope and were supplemented with studies involving use of tritiated and neutron-activated asbestos.

Chrysotile filbers were injected into the stomach of rats, and 2-4 days later various tissues were solubilized and their fiber content studied. Fibers were isolated from the blood, spleen, omentum, and brain of the treated rats. Highest levels of orally administered fibers decreased within 24 hr in the blood, lung, and spleen; the count remained high in tissues such as the omentum and brain.

*16-0047
ASBESTOS

Volkheimer, Gerhard
PASSAGE OF PARTICLES THROUGH THE WALL OF THE GASTROINTESTINAL TRACT
Environ. Health Perspect. 9: 215-25 (Dec. 1974)

In the normal process of digestion, not only substances in solution are absorbed. Solid, undissolved particles in macrocorpuscular form, are "kneaded" into the mucosa during their passage through the digestive tract. These particles in the micrometer size range pass between the epithelial cells into the subepithelial layer. From here they are transmitted both by the lymph vessels and by the mesenteric veins into the circulation, where they remain for a considerable time. This phenomenon, termed persorption, was investigated in detail.

Paper presented at the NIEHS-EPA conference on "Biological Effects of Ingested Asbestos," Durham, N. Carolina, 18-20 Nov. 1973.

*16-0048
ASBESTOS

Westlake, G.E.
ASBESTOS FIBERS IN THE COLONIC WALL
Environ. Health Perspect. 9: 227 (Dec. 1974)

Brief review of animal studies to determine disposition of asbestos fibers, chrysotile particles in colonic wall of rats fed fairly pure chrysotile.

*16-0049
ASBESTOS

Langer, Arthur M.
INORGANIC PARTICLES IN HUMAN TISSUES AND THEIR ASSOCIATION WITH NEOPLASTIC DISEASE
Environ. Health Perspect. 9: 229-33 (Dec. 1974)

An increased gastrointestinal cancer risk is associated with occupational exposure to asbestos fiber. Examination of tissues obtained from extrapulmonary organs of exposed workmen demonstrates the presence of asbestos fibers and bodies. The amount of fiber present in these tissues is many magnitudes less than encountered in the lung tissues from the same individuals. Ingestion of asbestos fiber in some environmental instances may approach in magnitude the amount resulting from occupational exposure. Disease factors are discussed.

*16-0050
ASBESTOS

Pooley, Fred
LOCATING FIBERS IN THE BOWEL WALL
Environ. Health Perspect. 9: 235 (Dec. 1974)

Brief comment on animal experiments underway to study effects of ingested asbestos fibers on gastrointestinal tract via the bowel wall.

*16-0051
ASBESTOS

Rickert, Robert R.
TECHNIQUE FOR THE SYSTEMATIC EXAMINATION OF COLON--RECTUM SPECIMENS
Environ. Health Perspect. 9: 237 (Dec. 1974)

Brief discussion of method of determining possible relationship between asbestos exposure and the development of colon-rectum cancer.

*16-0052
ASBESTOS

Zaidi, S.H.
INGESTION OF ASBESTOS
Environ. Health Perspect. 9: 239-40 (Dec. 1974)

Brief comment suggesting that the rat is not suitable animal for study of the effects of ingested asbestos on the gastrointestinal tract because of lack of similarity in its stomach and the human stomach. More accurate results might be possible from studies using dogs.

*16-0053
ASBESTOS

Suzuki, Yasunosuke
INTERACTION OF ASBESTOS WITH ALVEOLAR CELLS
Environ. Health Perspect. 9: 241-52 (Dec. 1974)

A number of electron microphotographs are presented showing the various aspects of phagocytosis of fibers in lung tissue.

The fibers were rapidly phagocytosed by alveolar macrophages, by polymorphonuclear leucocytes, and less frequently by alveolar epithelial cells. They were also found in the cytoplasm of the alveolar stromal macrophages. In the late stage of the disease, macrophages containing the minerals were recognized in the fibrous submesothelial connective tissues. In this stage, a cell intermediate in structure between the epithelial cell and the macrophage was observed in the alveolar lining. This cell showed strong phagocytic activity against the fibers.

The process of phagocytosis of the fibers was quite similar to that of other microparticles such as Thorotrast and India ink. It had been suggested that phagosomes containing the fibers became transformed into secondary lysosomes.

The fate of the phagocytosed fibers varied. Some were partly dissolved or digested with marked reduction in the thickness of the wall of the chrysotile fibril. Many became coated by hemosiderin which accumulated in the cytoplasm of the phagocytic cells. This coating transformed the fibers into asbestos bodies. Finally many fibers were released because of the death of the host cell. Uncoated fibers as well as various stages of phagocytosis were observed in all animals, including those 1 to 2 years after the instillation of asbestos. This strongly suggests that fibers may be repeatedly phagocytosed, released and rephagocytosed, inducing a continuous response of the alveolar cells and maintaining the disease.

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*16-0054
ASBESTOS

Bruch, J.
RESPONSE OF CELL CULTURES TO ASBESTOS FIBERS
Environ. Health Perspect. 9: 253-4 (Dec. 1974)

The reaction of macrophages to asbestos and glass fibers was studied by light and by electron microscopy. Measurements were made of LDH release, staining with erythrosine B, and lactate production. Size and shape of asbestos fibers were found to have more effect than the physicochemical properties of the surface. Long fibers resulted in a protracted pathogenic but no acute cytotoxic effect.

*16-0055
ASBESTOS

Davis, J.M.G. et al
PENETRATION OF CELLS BY ASBESTOS FIBERS
Environ. Health Perspect. 9: 255-60 (Dec.1974)

Studies on the behavior of asbestos fibers within tissues have shown that the only cells that regularly contain asbestos are macrophages and their derivatives. However, these cells actively incorporate the asbestos fibers by the process of phagocytosis, and there is little evidence of direct penetration. Examination of the gut lining after prolonged asbestos ingestion has shown no evidence of dust penetration either through or between the epithelial cells. The structure and arrangement of these cells is discussed, and it is suggested that they are exceptionally well adapted to prevent penetration by any solid material.

*16-0056
ASBESTOS

Schnitzer, R.J.
MODIFICATION OF BIOLOGICAL SURFACE ACTIVITY OF PARTICLES
Environ. Health Perspect. 9: 261-6 (Dec. 1974)

The hemolytic activity of fibrous asbestos varieties and of fibrous or granular silica dust can be markedly reduced by adsorption of polymers. Polyanions exert a specific action on asbestos, particularly chrysotile, whereas silica is inactivated by nonionic polymers. A high degree of reduction of the lytic action by comparatively small amounts of the antagonistic polymers can be demonstrated after short exposure to concentrations of 0.1–0.4 mg/ml of appropriate polymers. Inactivation is based on stable adsorption. Repeated washings of inactivated mineral sediments or exposure to elevated temperatures (80–120°C) produced no essential loss of the reduction of lytic potency. In one example, inactivation of chrysotile by sodium alginate, depolymerization by ascorbic acid was also ineffective.

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*16-0057
ASBESTOS

Hayashi, Hisato
CYTOTOXICITY OF HEATED CHRYSOTILE
Environ. Health Perspect. 9: 267-70 (Dec. 1974)

Cytotoxicity and hemolysis were studied in chrysotile and quartz. The biological activity of the surface seemed to be different between chrysotile and quartz. Quartz lost its cytotoxicity on heating over about 500°C. However chrysotile showed remarkable toxicity and induced hemolysis on heating between 630 and 800°C, compared with the original unheated specimens. The mice injected intraperitoneally with minerals heated in this temperature range generally died within 48 hr after injection, while those injected with untreated chrysotile or chrysotile heated in the other heat ranges did not. The products in this range were highly disordered materials. It was assumed that the change of biological effects resulting from heat treatment may be related to the disordered state of chrysotile in the process of transformation into forsterite. The relationship between chemical character and cytotoxicity of the heated chrysotile specimens was also studied.

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*16-0058
ASBESTOS

Harington, J.S.
FIBROGENESIS
Environ. Health Perspect. 9: 271-9 (Dec. 1974)

A review of fibrogenesis by asbestos fibers is given. There is nothing to indicate that the fibrogenic effects of inhaled asbestos fibers should differ in any way from those of ingested asbestos. Recently, ingestion has assumed some importance concerning human exposure. Three sections dealing with the process of fibrogenesis are covered: the first deals with *in vitro* fibrogenesis, in particular the interrelation of macrophages damaged by dusts and the subsequent laying down of collagen by fibroblasts in culture; the second deals with *in vivo* fibrogenesis after the inoculation of extracts of silica-treated macrophages into various animals, and the third, with the fibrogenicity of a wide variety of mineral fibers in man and experimental animals.

Recent studies described in the first section of the present review appear to offer a better understanding of the effects of macrophages on fibroblasts after tissue damage of various kinds has occurred.

*16-0059
ASBESTOS

Douglas, Steven D.
MONOCYTE AND MACROPHAGE REACTIONS
Environ. Health Perspect. 9: 281-2 (Dec. 1974)

Brief comments on properties of the monocyte-macrophage as they might relate to the biological effects of ingested asbestos.

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*16-0060
ASBESTOS

Chvapil, Milos
PHARMACOLOGY OF FIBROSIS AND TISSUE INJURY
Environ. Health Perspect. 9: 283-94 (Dec. 1974)

Methods controlling tissue fibrosis are classified into those *specifically* inhibiting various metabolic aspects of collagen *selectively* in the injured tissue (ascorbic acid deficiency, effect of agent chelating Fe^{2+}, proline analogs, lathyrogens). The most promising method seems to be the blocking of crosslinks formation among collagen molecules by β-aminopropionitrile, a competitive inhibitor of a crosslinking enzyme, lysyl oxidase. The second group of methods is called nonspecific, as they affect any stage of inflammatory process preceding the activation of fibroblasts. The importance of activated macrophages in the stimulation of fibroblast is discussed. Finally, a new concept is proposed, indicating the function of zinc ions in the control of the integrity of biomembrances, tissue reactivity to noxious agents. It is suggested that zinc may control NADPH dependent lipid peroxidation at the membrane level by inhibiting NADPH oxidase activity. The implication of these ideas to lung fibrosis induced by silica or asbestos is discussed.

Paper presented at NIEHS-EPA conference on "Biological Effects of Ingested Asbestos," Durham, N. Carolina, 18-20 Nov. 1973.

*16-0061
ASBESTOS

Heppleston, A.G.
CORRELATION BETWEEN THE TISSUE RESPONSE AND ASBESTOS FIBER CONTENT
Environ. Health Perspect. 9: 295-6 (Dec. 1974)

Asbestos fiber concentration increases in proportion to the degree of pulmonary fibrosis as far as the moderate grade. No such correlation occurs with severe asbestosis, nor with the morphological form which the fibrosis assumes, and here secondary factors may be concerned. Electron microscopy suggests that optically visible fibers constitute a reasonably constant proportion of the total irrespective of the pathological reaction. Light microscopy may thus afford a guide to the total asbestos concentration. Finally, the development of mesothelioma, whether of the pleura or the peritoneum, appears to be unrelated to the concentration of coated or uncoated asbestos fibers residing in the lung.

*16-0062
ASBESTOS

Burrell, Robert
IMMUNOLOGICAL REFLECTIONS ON ASBESTOS
Environ. Health Perspect. 9: 297-8 (Dec. 1974)

Brief comments on immunological responses to environmental agents, raising such questions as whether the naked asbestos fiber may be antigenic itself. Although silica is not, evidence indicates that beryllium is a good antigen.

*16-0063
ASBESTOS

Selikoff, Irving J.
EPIDEMIOLOGY OF GASTROINTESTINAL CANCER
Environ. Health Perspect. 9: 299-305 (Dec. 1974)

Some 99,000 new cases of cancer of the colon are expected next year, an incidence rate higher than that for both cancer of the lung and cancer of the breast. Evidence from geographic pathology suggests that some environmental factors play a strong role in its etiology. Data obtained in the 1959 survey of one million people by the American Cancer Society and followed since, has failed to show correlation with any of the large number of factors listed. It is suggested that the etiology is one of multiple factors. The synergistic effect of exposure to asbestos and cigarette smoking in the production of bronchogenic carcinoma is demonstrated by data on cohorts of insulation workers. There was also a modest increase in the number of deaths from gastrointestinal cancer in asbestos workers, but smoking did not seem to act in synergistic fashion at that site, except perhaps in the esophagus. Deaths from cancer occurred almost entirely after a period of 20 years or more from initial exposure. The death rate from cancer tended to increase with duration of exposure, but a distinct rise over the expected was seen in those who had been exposed less than one year to amosite dust.

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*16-0064
ASBESTOS

Schneiderman, Marvin A.
DIGESTIVE SYSTEM CANCER AMONG PERSONS SUBJECTED TO OCCUPATIONAL INHALATION OF ASBESTOS PARTICLES: A LITERATURE REVIEW WITH EMPHASIS ON DOSE RESPONSE
Environ. Health Perspect. 9: 307-11 (Dec. 1974)

Human data show a dose-response relationship between industrial exposure to asbestos and later development of cancer of the bronchus and lung and of cancer of the digestive tract. The data do not provide much evidence for a threshold or for the existence of a clearly "safe" level of exposure. Good dose-response data, with quantitative estimates of dose are uncommon; however, in all the literature reviewed only one paper did not support the conclusion that increased exposure to inhaled asbestos particles leads to increased digestive system cancer.

*16-0065
ASBESTOS

Pott, F. et al
TUMORIGENIC EFFECT OF FIBROUS DUSTS IN EXPERIMENTAL ANIMALS
Environ. Health Perspect. 9: 313-15 (Dec. 1974)

Fibrous dusts (chrysotile, glass fibers, nemalite, palygorscite, and gypsum) and granular dusts (actinolite, biotite, hematite, pectolite, sanidine, and talcum) were injected intraperitoneally into rats. The fibrous dusts (other than gypsum) resulted in a high incidence of mesothelioma (30 – 67%). Gypsum produced only 5% and granular dusts none at all. It is suggested that the fibrous shape leads to a high multiplication rate of cells and predisposes to tumor formation. Fibrosis, in the other hand, does not so predispose. Milled chrysotile with 99.8% fibers than 5 μm in length are carcinogenic in our experience. The carcinogenicity of glass fibers in our experiments may have significance for occupational situations.

*16-0066
ASBESTOS

Churg, Jacob
PERITONEAL MESOTHELIOMA
Environ. Health Perspect. 9: 317-8 (Dec. 1974)

Brief review of cases of cancer considered to be mesothelioma in 82 people, from a population group in which about 90% of the people have asbestos exposure.

*16-0067
ASBESTOS

Amacher, D.E. et al
EFFECTS OF INGESTED CHRYSOTILE ON DNA SYNTHESIS IN THE GASTROINTESTINAL TRACT AND LIVER OF THE RAT
Environ. Health Perspect. 9: 319-24 (Dec. 1974)

The effects of chrysotile on DNA synthesis in the gastrointestinal tract of the rat were studied by measuring the uptake of tritium-labeled thymidine; whole stomach, small intestine, colon liver were removed, cleaned, and homogenized and the DNA was isolated and assayed for tritium label.

A dose-response study indicated that 2 weeks after a 5 mg/kg dose of chrysotile, DNA synthesis was increased in the small intestine and colon and reduced in the liver; synthesis was reduced in the small intestine 2 weeks after a 500 mg/kg dose. Following a 100 mg/kg dose of chrysotile, a transient increase in DNA synthesis was noted in the stomach and small intestine at 1 and 7 days, respectively, besides increased synthesis in the colon from 28 to 63 days. These data suggest that asbestos penetrates the gastrointestinal mucosa and influences regulation of DNA synthesis in the gastrointestinal tract.

*16-0068
ASBESTOS

Stewart, Harold L.
USE OF EXPERIMENTAL ANIMALS
Environ. Health Perspect. 9: 325-6 (Dec. 1974)

Brief review of different animals to be used in studies of bowel cancer with asbestos, the combinations of carcinogens, and the different tumors developed by experimental animals. Mention is made that β-naphthylamine, for instance, produced bladder cancer in dogs but not in rats, rabbits, or guinea pigs and was only a weak carcinogen for mice.

*16-0069
ASBESTOS

Smither, W.J.
ASBESTOS IN THE WORKPLACE AND THE COMMUNITY
Environ. Health Perspect. 9: 327-9 (Dec. 1974)

Information developed by Newhouse in a survey of an asbestos factory in London suggests that the risk of mesothelial tumors is strongly related to both the degree and the length of exposure to asbestos dust.

*16-0070
ASBESTOS

Epstein, Samuel S.
MULTIPLE FACTORS IN CARCINOGENESIS
Environ. Health Perspect. 9: 331-3 (Dec. 1974)

Brief discussion of effect of multiple factors in the development of cancer, e.g., enhancement by smoking of the incidence of bronchogenic cancer after occupational exposure to asbestos.

*16-0071
ASBESTOS

Langer, Arthur M.
RESEARCH PERSPECTIVES CONCERNING ASBESTOS MINERALS AND THEIR EFFECTS ON BIOLOGICAL SYSTEMS
Environ. Health Perspect. 9: 335-8 (Dec. 1974)

The interaction of asbestos minerals with biological materials is under intensive investigation throughout the world today. Physical scientists should be responsible for the selection of fibers, and their varietal types, for biological studies; they should characterize these experimental materials physically and chemically to the level of sophistication which currently exists in their fields; they should develop definitive assay methods to monitor changes in such characteristics after biological residence; they should actively participate in the formulation of theories or mechanisms of particle interaction in biological systems.

Physical scientists should begin the characterization of minerals in the environment and the determination of ambient fiber levels in air and potable water supplies. Such characterization of the environment requires standardized instrumentation and preparation techniques. Acquisition of data in numbers large enough to achieve statistical significance requires the development of automated counting strategies. Instrumentation and software have yet to be developed. The training of physical scientists in environmental areas is lagging behind current national needs and must be accelerated.

*16-0072
ASBESTOS

Huff, James Edward et al
A HEALTH VIEW OF ASBESTOS (AN ANNOTATED LITERATURE COLLECTION--1960-1974)
Environ. Health Perspect. 9: 341-462 (Dec. 1974)

Bibliography prepared by the Biomedical Sciences Section, Environmental Information System Office, Oak Ridge National Laboratory, Oak Ridge, Tenn.

See: 16-0002, Arsenic

See: 16-0005, Arsenic

Daughtrey, E.H. and Harrison, W.W.
ANALYSIS FOR TRACE LEVELS OF BORON BY ION EXCHANGE-HOLLOW CATHODE EMISSION
Anal. Chimica Acta 72 (2): 225-30 (Oct. 1974)

Analysis for trace levels of boron in biological materials and natural waters has been hindered by the lack of methods sensitive enough to be used without preconcentration of the sample.

This paper reports the successful use of the hollow-cathode emission (HEC source) for the determination of boron in several biological materials and natural water samples down to the sub-nanogram level. Potential organic and inorganic interferences were removed by use of low-temperature ashing and ion-exchange separation.

Stula, E.F. et al
EXPERIMENTAL NEOPLASIA IN RATS FROM ORAL ADMINISTRATION OF 3,3'-DICHLOROBENZIDINE, 4,4'-METHYLENE-BIS(2-CHLOROANILINE), AND 4,4'-METHYLENE-BIS-(2-METHYLANILINE)
Toxicol. Appl. Pharmacol. 31 (1): 159-76 (Jan. 1975)

Under the diet conditions described, 3,3'-dichlorobenzidine, 4,4'-methylenebis (2-chloroaniline), and 4,4'-methylenebis(2-methylaniline), which are used as curing agents for urethane rubbers and epoxy resins, were found to be carcinogenic for rats.

Sandberg, D.V. et al
EMISSIONS FROM SLASH BURNING AND THE INFLUENCE OF FLAME RETARDANT CHEMICALS
Air. Pollut. Contr. Ass. J. 25 (3): 278-81 (March 1975)

The use of a flame retardant, diammonium phosphate (DAP), in the open burning of ponderosa pine logging slash not only failed to reduce the amount of air pollutants but actually increased the amount in all cases, particularly the particulates. Untreated fuel beds yielded emission factors for CO, hydrocarbon gases, and particulates of 146, 8.4, and 9.1 lb/ton of fuel, respectively. DAP-treated beds gave factors of 166, 11.7, and 19.3 lb/ton of fuel, respectively. In addition, less DAP-treated fuel actually burned.

*16-0076
FLUOROCARBONS

Anon
FEDERAL TASK FORCE PROBES OZONE ISSUE
Chem. Eng. News 53 (10), 17 (March 10, 1975)

Testimony given to the new Federal Interagency Task Force on Inadvertent Modification of the Stratosphere (MOS) stressed the depletion of ozone in the stratosphere to be expected in about 50 years if the use of aerosols containing chlorofluorocarbons continues at 1972-74 rate, and points out the potential of ozone depletion by bromine found in bromide-containing aerosols.

Industry-funded programs, subsidized by about $1.25 million in 1975, which are administered by the Manufacturing Chemists Association, are listed and described briefly.

*16-0077
FLUOROCARBONS

Anon
FLUOROCARBON/OZONE DEBATE
Environ. Rept. 5 (21): 165 (March 5, 1975)

Brief review of potential hazards from continued use of fluorocarbons and other man-made substances, such as bromides, which are released into the atmosphere from plastic manufacturing and the fumigation of crops. Bromides reputedly are sufficiently effective in destroying ozone to be considered for use as a weapon of war.

*16-0078
FLUOROCARBONS

Walton, B. et al
"HALOTHANE HEPATITIS" (Letter to the Editor)
Anesthesiology 41 (4): 415 (Oct. 1974)

To test the theory that "halothane hepatitis" might result from the combination of a metabolite of halothane with protein, the writers conducted *in vitro* tests of lymphocyte transformation and leukocyte migration inhibition in the presence of trifluoroacetate chemically conjugated with human serum albumin and liver specific protein. Negative results were recorded in all tests. On the other hand, another recent study indicating that isoflurane is metabolized in man to non-ionic fluoride provides evidence that trifluoroacetate is the active metabolite.

*16-0079
FLUOROCARBONS

Steffey, E.P. and Eger, E.I., II
HYPERTHERMIA AND HALOTHANE MAC IN THE DOG
Anesthesiology 41 (4): 392-6 (Oct. 1974)

The effect of an increase in temperature on anesthetic requirements was measured by determining the minimum alveolar concentration (MAC) of halothane needed to eliminate movement in response to a painful stimulus. In the dogs used in the experiments MAC increased as temperature rose from 37 to 42°C; above 42°C, MAC declined; and death occurred at 45.9°C. These findings agree with clinical impressions that hyperthermia increases anesthetic requirement.

*16-0080
FLUOROCARBONS

Draffan, G.H. et al
ALVEOLAR GAS CONCENTRATIONS OF FLUOROCARBONS-11 AND -12 IN MAN AFTER USE OF PRESSURIZED AEROSOLS
Thorax 29 (1): 95-8 (Jan. 1974)

The results of this study to measure alveolar concentrations of F-11 and F-12 after the use of an inhaler and to compare the concentrations with those shown to sensitize animal hearts to arrhythmias indicate that a single inhalation should carry no hazard. Multiple inhalations might, however, be dangerous, the single study conducted indicating that alveolar gas concentration in man approached the values that sensitize the dog heart to arrythmias. Patients should take a few normal breaths between inhaled doses to prevent accumulation of fluorocarbon in the lung.

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*16-0081
FLUOROCARBONS

Weiskopf, Richard B. et al
EFFECTS OF HALOTHANE ON CANINE RESPIRATORY RESPONSES TO HYPOXIA WITH AND WITHOUT HYPERCARBIA
Anesthesiology 41 (4): 350-60 (Oct. 1974)

A marked depression of the ventilatory response to hypoxia by halothane was noted in the dogs tested. Although it is not known that man would respond in the same manner, the anesthesiologist should assume that hypoxia may not stimulate but, rather, may depress ventilation during halothane anesthesia, as well as blocking the usual response to CO_2.

*16-0082
FLUOROCARBONS

Stanaszek, W.F. et al
HALOTHANE UPTAKE BY COACERVATE SYSTEMS
J. Pharmaceutical Sci. 63 (12): 1941-3 (Dec. 1974)

The significant halothane gas uptake noted in the highly structured concervate system may indicate the presence of a highly structured, nonpolar system, somewhat like surfactant micelles in a polar medium.

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*16-0083
FLUOROCARBONS

Gillies, Charles W.
OZONOLYSIS OF CIS- AND TRANS-1,2-DIFLUOROETHYLENE. STEREOSELECTIVITY IN EPOXIDE FORMATION
J. Amer. Chem. Soc. 97 (5): 1276-8 (March 5, 1975)

Results indicate that cis-1,2-difluoroethylene oxide and formyl fluoride are the major products from the ozonolysis of both cis- and trans-1,2-difluoroethylene in methyl chloride.

16-0084
HALOETHERS

Dolan, William M. et al
THE CARDIOVASCULAR AND RESPIRATORY EFFECTS OF ISOFLURANE-NITROUS OXIDE ANAESTHESIA
Canad. Anaesth. Soc. J. 21 (6): 557-68 (Nov. 1974)

The cardiovascular and respiratory effects of anesthesia (isoflurane with 70% nitrous oxide) are reported for tests made on eight healthy, unpremedicated volunteers. The isoflurane-nitrous oxide anesthesia produced less hypotension than isoflurane alone, and did not ameliorate the respiratory depression caused by isoflurane alone.

16-0085
HALOETHERS

Anon
BCME (BIS-CHLOROMETHYL ETHER). . .
Chem. Eng. 82 (6): 19 (March 17, 1975)

Tests by various textile-finishing plants (some in cooperation with NIOSH) revealed the presence of the carcinogen, bis(chloromethyl) ether (BCME) in two plants, according to the Textile Manufacturers Institute. BCME was formed during durable-press-fabric operations where formaldehyde resins were used in the presence of chlorides. Some companies now have switched to zinc nitrate instead of magnesium chloride and are using resins with less than 1 ppm of free formaldehyde instead of resins that contained up to 7 ppm. NIOSH is working towards improved sampling techniques and planning studies of the chemistry of BCME formation.

See: 16-0002, Arsenic

Burns, James E. and Miller, Fred M.
HEXACHLOROBENZENE CONTAMINATION: ITS EFFECTS IN A LOUISIANA POPULATION
Arch. Environ. Health 30 (1): 44-8 (Jan. 1975)

This study resulted from the finding that cattle in Louisiana were contaminated with hexachlorobenzene (HCB), apparently derived from waste from the production of chlorinated solvents, primarily carbon tetrachloride and perchloroethylene.

Plasma HCB in a sample of 86 people averaged 3.6 ± 4.3 ppb. Although a worker in a waste disposal factory had a level of 345 ppb, the highest level in the general population was 23 ppb. No evidence of cutaneous porphyria was found, but there were indications of a possible connection between HCB residues and coproporphyrin and lactic dehydrogenase. HCB levels in household dust correlated with plasma levels. Plasma HCB levels up to 233 ppb were found in perchloroethylene and CCl_4 production workers.

16-0087
HYDRAZINE

Mian, N. et al
GLYCOSIDASES HETEROGENEITY AMONG DIMETHYLHYDRAZINE INDUCED RAT COLONIC TUMOURS
Br. J. Cancer 30 (3): 231-6 (Sept. 1974)

Tests conducted to investigate the enzymatic heterogeneity of tumors induced by 1,2-dimethylhydrazine (DMH) in the rat colon suggested that enzymatic differences could be due to site specificity. Enzyme content of the induced tumors were different animals. DMH treatment caused a significant increase in levels of glycosidases in the descending colon and also produced more adenocarcinomas there than in other parts of the colon.

16-0088
LIQUEFACTION AND GASIFICATION OF COAL

Pasternak, Alan
METHYL ALCOHOL PRODUCTION BY IN SITU COAL GASIFICATION
California Univ., Livermore. Lawrence Livermore Lab. (27 Aug. 1974) UCRL-51600

A process for in situ gasification leading to methyl alcohol production is described, and the thermodynamics and costs of the process are outlined. The production route involves gasification of coal to carbon monoxide and hydrogen (synthesis gas) and high-pressure catalytic conversion of these gases to methyl alcohol. Capital requirements are estimated to be $154 million for annual production of methyl alcohol with a fuel value of 81 trillion Btu's. The selling price is estimated to be $1.04 per million Btu's (5.9 cents per gallon). Adding distribution costs to these production costs, it is estimated that methyl alcohol could reach service station pumps at a price competitive with gasoline. (Modified author abstract)

[(Abst. in: NTIS Weekly Govt. Abstracts. Chemistry p. 79 (March 3, 1975)]

16-0089
LIQUEFACTION AND GASIFICATION OF COAL

Smil, Vaclav
ENERGY AND AIR POLLUTION: USA 1970-2020
Air Pollut. Contr. Ass. J. 25 (3): 233-6 (March 1975)

A series of computer simulations is presented as a means of predicting patterns of future power industry alternatives for the U.S. The present state of uncertainty within the industry makes it difficult to predict future trends or to determine the future levels of air pollutants that will be generated by the different energy sources. If the U.S. achieves self sufficiency in energy during the 1980's, that situation will most likely evolve through massive increases in the use of coal and nuclear fuels.

Emissions from coal gasification are shown in simulation model.

16-0090
LIQUEFACTION AND GASIFICATION OF COAL

Anon
A NEW PROCESS DEVELOPMENT UNIT PLANT. . .
Air Pollut. Contr. Ass. J. 25 (3): 298 (1975)

Bethlehem Steel Corp. will operate a process development unit plant to test "Synthoil" technology for converting coal into a clean-burning liquid fuel. Costs will be shared by the Bureau of Mines.

Plant, near Bruceton, Pa., should be ready for shakedown runs in 1976. When completed, Bethlehem will operate the plant for 2 years, contributing $1.1 million to operating expenses and $0.5 million for research.

16-0091
LIQUEFACTION AND GASIFICATION OF COAL

Anon
CREATION OF A SYNTHETIC FUELS INDUSTRY IN THE U.S. ...
Chem. Week 116 (11): 18 (March 12, 1975)

The Ford administration is pushing for a synthetic fuels industry, judging from ERDA's attempt to try to get some coal conversion plants committed in 1975. Over 20 major plants will have to be under construction by 1980 in order to achieve the 1 million bbls/day of synthetic fuel in 1985 desired by President Ford.

Anon
PROJECT INDEPENDENCE GETS RAKED OVER THE COALS
Chem. Wk. 116 (12): 31-3 (March 19, 1975)

New study of energy self-sufficiency plan finds FEA expects too much from oil and gas, overlooks need for beefing up coal and nuclear power capacity.

Table shows Commerce Dept's Technical Advisory Board (CTAB) estimates and planning base for 1985 energy supply, including shale oil, synthetic oil, and synthetic gas.

Anon
SOUTH AFRICA EXPANDS COAL CONVERSION UNIT
Chem. Eng. News 53 (11): 5-6 (March 17, 1975)

South Africa's planned new facility, Sasol-II, to produce fuels from coal is feasible because of abundance of coal and cheap labor in that country. High capital investment argues against a similar facility in U.S. or Europe.

Massey, Lester G.
COAL GASIFICATION
Amer. Chem. Soc. Wash., D.C., Advances in Chemistry Series No. 131, (1974).
266 pp. $14.50

Includes 14 papers presented at a symposium sponsored by the Division of Fuel Chemistry of the American Chemical Society on reaction mechanisms, plasma pyrolysis of coal, underground liquefaction, etc.

16-0095
4,4'-METHYLENEBIS
(2-CHLOROANILINE) (MOCA)

Russfield, Agnes B. et al
THE CARCINOGENIC EFFECT OF 4,4'-METHYLENE-BIS-(2-CHLOROANILINE) IN MICE AND RATS
Toxicol. Appl. Pharmacol. 31 (1): 47-54 (Jan. 1975)

The maximally tolerated dose of 4,4'-methylenebis(2-chloroaniline) in their diets was 1000 mg/kg in rats and 2000 mg/kg in mice. Female mice, given either 2000 or 1000 mg/kg, were more susceptible to the compound than were male mice. The females showed a statistically significant incidence of hepatoma, indicating that this compound is definitely carcinogenic in female mice. Treated animals showed a higher incidence of tumors than did the controls. Rats developed hepatomas and lung adenomatosis; mice developed hemangiosarcomas and hemangiomas.

16-0096
4,4'-METHYLENEBIS
(2-CHLOROANILINE) (MOCA)

Anon
DEPARTMENT OF LABOR
Rubber Age 107 (3): p.6 (March 1975)

A continuing court battle is seen for the 4,4'-methylenebis(2-chloroaniline) issue now that the Dept. of Labor has petitioned the U.S. Court of Appeals for a re-hearing on its decision to vacate OSHA's permanent standards for MOCA. The court's earlier findings for the Polyurethane Manufacturers Association prohibits OSHA from enforcing any of the specific terms of its MOCA standard.

See: 16-0074, 3,3'-Dichlorobenzidine

16-0097
MODEL ECOSYSTEMS
(Environmental Fate Testing, Micro Ecosystems)

Giese, Ronald L. et al
PEST MANAGEMENT
Science 187 (4181): 1045-52 (March 21, 1975)

A pilot project showing new ways of dealing with important agricultural pests is based on crop ecosystem simulation, automated weather data acquisition, and computer - based management information system.

16-0098
MODEL ECOSYSTEMS
(Environmental Fate Testing, Micro Ecosystems)

Anon
WORLDWATCH IN ORBIT
Science 187 (4181): 1063 (March 21, 1975)

Worldwatch Institute, Wash. D.C., established by Lester Brown, will examine the ecological undermining of food systems by deforestation, overgrazing, climatic changes, etc.

Moore, Peter D.
DECOMPOSITION IN PEATLANDS
Nature 253 (5492): 498-9 (Feb. 13, 1975)

Peatland ecosystems are discussed briefly, considering respiration and decomposition

MODEL ECOSYSTEMS

See also: 16-0118, General Information

Becker, J.W.
MEASUREMENT OF NAPHTHYLAMINES. . .
Rubber Age 107 (3): 53-4 (March 1975)

Recent, improved analytical procedure of great sensitivity aids measurement of naphthylamines in rubber antioxidants. Concern over the potential carcinogenicity of N-phenyl-β-naphthylamine and N-phenyl-α-naphthylamine, even though neither has shown toxic or carcinogenic effects in animal studies or in workers, indicates need for more knowledge.

NAPHTHYLAMINES

See: *16-0068, Asbestos

Kubinski, H. and Szybalski, Elizabeth H.
INTERMOLECULAR LINKING AND FRAGMENTATION OF DNA BY β-PROPIOLACTONE, A MONOALKYLATING CARCINOGEN
Chem. Biol. Interactions 10: 41-55 (1975)

Previous studies have shown that β-propiolactone (BPL) has promoted mutations in lower organisms and induced tumors in animals; that it binds *in vivo* and *in vitro* to cellular macromolecules, including nucleic acids; and that *in vitro* it cross-links DNA to purified proteins and to cellular membranes.

In this paper, physico-chemical methods show the effects of BPL on DNA alone. Experiments were conducted with previously described bacterial and phage strains. The sedimentation rate of purified *E. coli* DNA in neutral or alkaline sucrose gradients increased when exposed briefly to BPL. Prolonged exposure caused localized denaturation, noted by single- and double-strand breaks in DNA. Large complexes, formed when the single-stranded DNA "whiskers" react with other DNA molecules, are thought to be linked through covalent bonds. The macromolecular alterations observed may possibly be involved in BPL-induced mutations and tumor formations. The reported results may help to explain BPL effects in higher organisms or clarify the actions of other toxic and carcinogenic chemicals.

16-0102
TRICHLOROETHYLENE

Pembleton, W.E.
TRICHLOROETHYLENE ANESTHESIA RE-EVALUATED
Anesthesia & Analgesia. . . Current Res. 53 (5): 730-3 (Sept.- Oct. 1974)

Reported instances of hepatitis, presumably caused by the anesthetic, halothane, suggests that alternative anesthetics might be considered. Thirty years ago, the use of trichloroethylene was suggested for this purpose but, because of difficulties with its administration, it was not generally accepted.

A review of 535 cases in which trichloroethylene served satisfactorily as an anesthic, coupled with the findings of a recent report of its satisfactory use for 1000 cases, indicates that attention should now be given to this compound. With current apparatus accurate determinations of the concentration used are possible. Without the soda lime absorber and with assisted respiration, trichloroethylene should work.

16-0103
TRICHLOROETHYLENE

Bauer, Marjorie & Rabens, Steven Fisher
CUTANEOUS MANIFESTATIONS OF TRICHLOROETHYLENE TOXICITY
Arch. Dermatol. 110 (6): 886-90 (Dec. 1974)

Unlike the 99% pure trichloroethylene (Trilene) used for anesthesia, commercial trichloroethylene contains impurities and is sometimes used at temperatures that promote formation of toxic decomposition products. Acute toxic effects, following massive inhalation, include damage to the liver, heart, and kidneys, and even death. Phosgene, a product of trichloroethylene's thermal decomposition, causes pulmonary edema. Chronic inhalation causes trigeminal anesthesia, anosmia, muscle weakness, etc. On skin, trichloroethylene acts as a primary irritant and a sensitizer, sometimes producing generalized dermatitis. Four workers in metals degreasing plants, hospitalized from general dermatitis (accompanying symptoms being inebriation, eye and upper respiratory tract irritations, abnormal liver function tests, etc.), illustrate skin effects of the compound. Industry should comply with trichloroethylene safety standards.

Anon
DOW CHEMICAL AIMS. . .
Chem. Eng. 82 (6): 17 (March 17, 1975)

Dow Chemical, looking for low-Btu gas for fueling its power plants, wants to undertake a $42-million, 7-year development project for in situ production of oil and gas from Michigan oil shale; seeks federal funding. If activated, project most likely will emphasize gas production. Dow would probably plan to sell some of the recovered gas and oil, the latter being processed by the company's Bay City Refining subsidiary.

SHALE OIL EXTRACTION AND REFINING

See: 16-0092, Liquefaction and Gasification of Coal

16-0105
VINYL CHLORIDE

Malaveille, C. et al
MUTAGENICITY OF VINYL CHLORIDE, CHLOROETHYLENEOXIDE, CHLOROACETALDEHYDE AND CHLOROETHANOL
Biochem. Biophys. Res. Communications 63 (2): 363-70 (1975)

These studies on the effects of vinyl chloride and/or its metabolites in *S. typhimurium* strains (TA 1530, TA 1535, and G-46), mediated by liver fractions from rat, mouse, and humans, confirm the theory that such microsomal mixed function oxidases (the major target organ for VCM carcinogenic action in humans and animals) do convert VCM into mutagenic metabolites *in vitro*.

The TA 1530 strain exhibited the highest mutagenic response to VCM, and also showed a mutagenic response to chloroacetaldehyde, chloroethanol, and chloroethyleneoxide, but not to chloroacetic acid. The last compound caused toxic effects.

16-0106
VINYL CHLORIDE
(Production)

Anon
CHLORINE: . . .
Rubber Age 107 (3): 12 (March 1975)

Because of a decreased market for end products, industry has cut chlorine production 20%. One example: a 50% drop in demand for vinyl chloride.

16-0107
VINYL CHLORIDE

Kennedy, J. Patrick
CHANGING ECONOMY: ITS IMPACT ON EQUIPMENT
Chem. Eng. 82 (6): 54-60 (March 17, 1975)

Chemical and petroleum industries are making major changes in equipment design and processing operations to meet the challenge of rising energy costs, environmental regulation impacts, material and manpower shortages, and related factors.

This article shows how a process computer can aid companies in cutting costs and tightening controls, as exemplified by a discussion of PVC manufacture.

16-0108
VINYL CHLORIDE

Anon
CAN MONOMER WASHED FROM PVC PACKAGING CAUSE CANCER WHEN INGESTED?
Chem. Wk. 116 (12): 36 (March 19, 1975)

In experiments conducted by Cesare Maltoni, Institute of Oncology, Bologna, Italy, thymus and liver cancers were observed in rats that ingested VCM in a food. Olive oil containing 50 ppm, 16.65 ppm, and 3.3 ppm VCM was given to 3 groups of rats 5 times/week. After 52 weeks, one rat in the 50-ppm group died of thymus cancer; one rat in the 16.65-ppm group died of liver cancer. SPI argues that the doses are too high to represent normal human consumption, but FDA wants to study the data. FDA has suggested a 50-ppb limit on VCM migration in foodstuffs.

16-0109
VINYL CHLORIDE

Anon
A MAJOR USE OF VINYL CHLORIDE MAY BE WIPED OUT. . .
Chem. Eng. News 53 (11): 7 (March 17, 1975)

Another brief accounting of the finding of cancer in rats when fed VCM, as reported by Cesare Maltoni of Italy, suggests that a major use of VCM (in food packaging materials) is in danger of being eliminated by FDA.

16-0110
VINYL CHLORIDE

Anon
WILL PVC MAKERS LEARN TO LIVE WITH OSHA's VCM STANDARDS?
Mod. Plast. 52 (3): 14 (March 1975)

Despite stringent OSHA standards, most VCM and PVC manufacturers plan to continue production.

16-0111
VINYL CHLORIDE
(Uses)

Anon
AGPIPE PICKS UP
Mod. Plast. 52 (3): 54-5 (March 1975)

Recent increase in agricultural pipe activity is expected to continue through 1980, boosted by the popularity of drip irrigation and the push for greater food production. High use of PVC pipe in 1975 (104 thousand metric tons) is expected to about double in 1980.

16-0112
VINYL CHLORIDE

Gross, S.
VCM LESSONS (Editorial)
Mod. Plast. 52 (3): 39 (March 1975)

Dire predictions of collapse of the U.S. vinyl industry because of OSHA standard have fizzled. Will industry have learned a lesson? The "we can't survive" stance carries risk of scaring the user into looking for substitutes or oversea suppliers and destroys industry's credibility. Lesson for the Government should be to learn how to better define the issue, and to combine responsibility for nation's health with safeguarding of nation's standard of living.

See: 16-0002, Arsenic

See: *16-0015, Asbestos

Anon
MANUFACTURING CHEMISTS ASSOCIATION...
Rubber Age 107 (3): 6 (March 1975)

Although styrene has not yet been shown to cause any health hazards, the Manufacturing Chemists Association will administer industry-sponsored tests on that compound as well as on vinylidene chloride monomer.

16-0114
GENERAL INFORMATION

Anon
NUCLEAR/GAS/RADIATION
Environ. Rept. 5 (21): 164 (March 5, 1975)

Potential radioactive damage from the tritium in nuclear devices used to stimulate natural gas wells should not be a major health hazard for those eating food cooked with the gas. According to calculations made, an average whole-body dose of tritium to an individual would be only 0.02 millirem/year; a corresponding population dose to 100 million people from natural radiation sources is about 5000 times greater. Inhalation and skin absorption of tritium in the gas combustion products within the home have been shown to be greater sources of radiation hazard. Information is presented in Report ORNL-TM-4735, available from NTIS at $4.

16-0115
GENERAL INFORMATION

Anon
GEOCHEMISTRY/ENVIRONMENT:
Environ. Rept. p. 170 (March 5, 1975)

Papers presented at an AAAS meeting in Dallas, 1968, covering possible connection between geographic distribution of some elements and disease patterns, are incorporated into new NAS publication, "Geochemistry and the Environment, Vol.1," available from NAS at $8.50.

16-0116
GENERAL INFORMATION

Enterline, Philip E. and Henderson, Vivian
THE HEALTH OF RETIRED FIBROUS GLASS WORKERS
Arch. Environ. Health 30 (3): 113-6 (March 1975)

A study of the mortality records of 416 retired (during 1945 to 1972) fibrous glass insulation workers did not disclose any important health hazards attributable to their occupation. Three of the men retired because of chronic bronchitis, a higher number than might have been expected.

16-0117
GENERAL INFORMATION

Cavalleri, Alessandro
SERUM THYROXINE IN THE EARLY DIAGNOSIS OF CARBON DISULFIDE POISONING
Arch. Environ. Health 30 (2): 85-7 (Feb. 1975)

Forty-five workers exposed to carbon disulfide in an Italian viscose factory for periods ranging from 1 to 20 years showed significantly lowered serum thyroxine values, an indication of carbon disulfide poisoning. A significant correlation between serum thyroxine and cholesterol, also noted, supports the theory that a hypofunction of thyroid gland may cause the metabolic alterations leading to carbon disulfide vaculopathy.

16-0118
GENERAL INFORMATION

Tullar, Irving V. and Suffet, Irwin H.
THE FATE OF VANADIUM IN AN URBAN AIR SHED:
THE LOWER DELAWARE RIVER VALLEY
Air Pollut. Contr. Ass. J. 25 (3): 282-6 (1975)

Vanadium as an air pollutant is generated by such industrial processes as the combustion of vanadium rich fuel in refineries, power plants, and other industry; particulates evolve from the catalytic processing of petroleum refineries.

In lower Delaware River Valley, vanadium concentrations detected in the atmosphere from 1958 to 1969 ranged from 0.133 μg/cu m to 0.557 μg/cu m. Major sources were combustion of vanadium rich fuel oils and catalytic processing of high vanadium crudes.

In considering the chemical fate of vanadium in the air, the co-presence of sulfur dioxide and oxygen must be taken into account, the latter contributing to the prevalence of V_2O_5 emissions. A flow diagram of the fate of vanadium in air is included. Vanadium emissions have been linked with lung cancer, bronchitis, and pneumonia.

16-0119
GENERAL INFORMATION

Anon
BURDEN OF PROVING A CHEMICAL IS SAFE. . .
Chem. Week 116 (11): 47 (March 12, 1975)

As part of its findings in developing risk-benefit criteria for toxicological testing for EPA, the National Academy of Sciences is expected to suggest that the producer should bear the burden of proof for a chemical's safety.

16-0120
GENERAL INFORMATION

Anon
FIGHT ON OVER TOXICITY
Chem. Week 116 (11): 24 (March 12, 1975)

Brief review of Senate hearings on latest version of a bill to control toxic substances.

16-0121
GENERAL INFORMATION

Kristofferson, Ulf
GENETIC EFFECTS OF SOME GASOLINE ADDITIVES
Abstract of Paper Presented at 7th Mtg. of the Scandinavian Assoc. of Geneticists, Oslo, Norway, Aug. 12-14, 1974

Research at the Institute of Genetics, University of Lund, Sweden, was concerned with the effects of 1,2-dichloroethane (DCE), 1,2-dibromoethane (DBE), and 1,3-dibromopropane (DBP) on the three test systems: 1) *Allium* test, 2) human lymphocyte cultures, and 3) microorganisms. Although all three of these halogenated compounds in very low concentrations proved toxic to *Allium* roots, they did not cause any chromosome-breaking effect. DCE induced C-mitoses after 12 days. No chromosome-breaking effect in human lymphocytes was observed from any of the compounds, but all were very toxic. There was no evidence that DCE, DBE, or DBP induced lysis in the *E. coli* strain studied. DCE and DBE are gasoline anti-knock compounds.

[Abstract in: Hereditas 78 (2): 319 (1974)]

16-0122
GENERAL INFORMATION

Pendleton, Deedee
FISH TUMORS: CARCINOGENIC INDICATORS?
Science 107: 157-8 (March 8, 1975)

A further discussion of the possibility of using marine organisms to determine pollution levels in water, based on presence of tumors in fish. [See also: CATS 15-0036, Model Ecosystems]

16-0123
GENERAL INFORMATION

Bianchi, Diana W. et al
ABSENCE OF DAMAGE TO HUMAN CHROMOSOMES BY SPRAY ADHESIVES
Mutat. Res. 26 (6): 545-51 (1974)

Concern over the potential mutagenic effects of spray adhesives prompted six exposed individuals to have their blood examined. No significant elevations of chromosomal aberration frequency were found in the cultured leukocytes. The study failed to show any consistent increase in abnormal chromosome numbers or any other structural aberrations. The absence of any causal birth anomalies from spray adhesives exposure is indicated by two incidents: birth of a chromosomally abnormal child to control parents in the study, and the spontaneous abortion of a normal fetus by a woman whose husband had been exposed.

16-0124
GENERAL INFORMATION

Anon
FLOATING FERTILIZER FACTORIES: WAVE OF THE FUTURE?
Chem. Week 116 (12): 34 (March 19, 1975)

Shipboard chemical plants to produce ammonia and urea from offshore natural gas are now being built in W. Europe. The first fertilizer units will go to Pertamina, Indonesia's state oil company. Floating ships to natural gas fields in remote areas may be the way to develop those areas where traditional plants cannot be built. Sea-based process plants may also have environmental advantages.

16-0125
GENERAL INFORMATION

Anon
NEW USE TNT POLLUTANT
Environ. Rept. 5 (22): 175 (March 18, 1975)

Tetranitromethane, an air pollutant emitted during the manufacture of TNT, can be converted to nitroform, which is used in making high energy propellants for missiles. Limited supplies of nitroform have made the compound expensive. Navy researchers claim a 90% conversion possibility.

Anon
OIL/ALASKAN CRABS
Environ.Rept. 5 (22): 176 (March 18, 1975)

Alaskan Tanner crabs may be endangered by low-level oil pollution contamination. Laboratory tests showed that Prudhoe Bay crude oil in amounts as low as 0.56 ml/liter may be fatal, and 0.32 ml/liter may affect the crab's ability to molt. Additionally, a loss of 2 to 7 limbs was noted in crabs exposed to oil shortly after molting. It is suggested that other crustaceans may also be adversely affected by oil pollution. Complete findings are presented in MFR Paper 1074, "Effects of Prudhoe Bay Crude Oil on Molting Tanner Crabs, Chinoecetes bairdi," available from D83, Tech. Info. Center, Environmental Science Information Center, NOAA, Wash., D.C. 20235.

17-0001
ACETONITRILE

Kolthoff, I.M. and Chantooni, M.K. Jr.
INTRAMOLECULAR HYDROGEN BONDING IN MONOANIONS OF *o*-PHTHALIC ACID AND THE HOMOLOGOUS OXALIC ACID SERIES IN ACETONITRILE
J. Amer. Chem. Soc. 97 (6): 1376-81 (March 19, 1975)

Acetonitrile is used as the solvent in studying the intramolecular hydrogen bonding in monoanions of σ-phthalic acid and the homologous oxalic acid series, and their monomethyl or monoethyl esters.

17-0002
ACETONITRILE

Cooke, A.S. and Zoro, J.A.
THE EFFECTS OF p,p'-DDCN ON TADPOLES OF THE FROG RANA TEMPORARIA
Bull. Environ. Contam. Toxicol 13 (2): 233-7 (1975)

Tadpoles were exposed to concentrations of 0 to 1 ppm bis (p-chlorophenyl) acetonitrile (p,p'-DDCN) in water. Residues were found in tadpoles exposed to the higher levels (0.1 and 1.0 ppm), but none of the tadpoles died. Those exposed to 1 ppm behaved abnormally, and 10 of 30 tadpoles developed upcurved tails after 192 hours of treatment. Results indicate that p,p'-DDCN has a relatively low short-term toxicity to frog tadpoles.

Prescott, James H.
OIL GIANTS GEAR UP PETROCHEMICALS CAPACITY
Chem. Eng. 82 (7): 56-8 (March 31, 1975)

As earnings from refined oil products continue to shrink, oil companies are expanding into the petrochemical area. A table showing selected petrochemical activities and petrochemical position of seven major petroleum companies gives 1974 and 1978 capacity and market share for intermediates, plastic resins, and basic petrochemicals. Among the chemicals listed are acrylonitrile, toluene diisocyanate, vinyl chloride, and polyvinyl chloride.

Anon
INDUSTRYS PROBLEMS WITH CANCER AIRED
Chem. Eng. 53 (13): 4 (March 31, 1975)

Information from new studies of such known carcinogens as arsenic, aromatic amines, asbestos, benzidine and vinyl chloride were presented at a recent conference on occupational carcinogenesis, sponsored by the New York Academy of Sciences, where attendees heard that the hazards of the work place are spreading to families of the workers into the general population.

Some 35% of the families of 354 asbestos workers have shown lung abnormalities. In addition to an earlier DuPont report, the Soviets have reported skin and lung cancer from chloroprene and its derivatives in some workers, and Norway will conduct an epidemiological study of workers exposed to that chemical. A DuPont/NIOSH study will be undertaken and the National Cancer Institute's carcinogen bioassay program will include chloroprene.

Also reported: 1) high incidence of spontaneous abortions and birth defects in children of nurse anesthesiologists, constantly exposed to low amounts of volatile chemicals, including halogenated hydrocarbons; 2) a Japanese report of three lung cancers plus a maxillary malignant lymphoma in 147 benzyl chloride workers; and 3) NIOSH confirmation of the spontaneous formation of bis-chloromethyl ether from the reaction of formaldehyde and hydrochloric acid in some textile plants.

Anon
RESERVE WINS DELAY
Chem. Week 116 (13): 14 (March 26, 1975)

Reserve Mining will continue operations but is now under court order to stop its discharges into Lake Superior and take "reasonable immediate steps" to reduce air emissions. The last, according to one observer, because the judges apparently found evidence indicating that inhalation of asbestos leads to cancer. Reserve's applications for construction of an on-land disposal system at Milepost 7 have still not been permitted by the state of Minnesota.

ASBESTOS

See: 17-0004, Arsenic

See: 17-0004, Arsenic

17-0006
BROMINATED BIPHENYLS

Ruzo, Luis Octavio and Zabik, Mathew J.
POLYHALOGENATED BIPHENYLS: PHOTOLYSIS OF HEXABROMO AND HEXACHLOROBIPHENYLS IN METHANOL SOLUTION
Bull. Environ. Contam. Toxicol. 13 (2): 181-2 (Feb. 1975)

Because of a recent report of the harmful effect of a hexabromobiphenyl fire retardant (Firemaster BP-6) on dairy cows, accidentally given the retardant in contaminated feed, the photoreactivity of Firemaster BP-6 was compared with that of 2,2',4,4',5,5'-hexachlorobiphenyl. When photolyzed in methanol, both compounds underwent reductive dehalogenation and ring methoxylation. The brominated biphenyl, however, was about seven times more reactive than the chlorinated compound.

17-0007
BROMINATED BIPHENYLS

Anon
RETARDANT UNDER FIRE
Chem. Week 116 (13): 16 (March 26, 1975)

Better than 90% of Michigan's population may have ingested polybrominated biphenyl (PBB), a fire retardant, that was accidentally mixed with animal feed, according to autopsy results.

Five percent of about 100 pregnant mice and rats fed PBB bore offspring with cleft palates and exposed brains. Another study is underway to determine the effects of PBB on rat pregnancy. The Michigan Public Health Dept. will publish on May 1 a report on blood tests and physical examinations of over 300 people; up to 1.8 ppm pf PBB has been found in the blood tests.

The FDA, although not involved in the Michigan incident, has established permissible levels of PBB concentration of 0.3 ppm in meat and milk and 0.05 ppm in eggs. According to the FDA, PBB may be carcinogenic, it does accumulate within the body, and it is more toxic than the PCB's, which can cause liver damage.

One physician reported liver damage in 15 patients known to have eaten PBB-contaminated foods. Other studies to determine PBB's potential for liver damage are underway.

Anon
THE SUPREME COURT. . .
Chem. Eng. News 53 (12): 9 (March 24, 1975)

The Synthetic Organic Chemical Manufacturers Association's appeal for elimination of the occupational standards for ethyleneimine was denied by the Supreme Court.

17-0009
FLAME RETARDANTS

Anon
SIX-MONTH NEWS INDEX: FLAMMABILITY
Text. Chem. Color. _7_ (4): 47 (1975)

This special six-month cumulative index to information published from August 1974 through January 1975 on flammability and fire retardants is available from Merkel Enterprises, Charlottesville, VA, for $5 per single copy.

17-0010
FLAME RETARDANTS

Anon
FIRE RETARDANT FOR POLYESTER
Text. Chem. Color. _7_ (4): 47 (1975)

Pyrosan 497, a new durable flame retardant for polyester and acetate fabrics offered by Laurel Products Corporation, insures treated fabrics that will meet federal standard specifications for the flammability of children's sleepwear, DOC FF3-71. A product information sheet includes application methods.

17-0011
FLAME RETARDANTS

Calamari, T.A., Jr. et al
A STABLIZED THPOH SOLUTION WITH LOW FORMALDEHYDE RELEASE
Text. Chem. Color. 7 (4): 65/27-67/29 (1975)

After developing THPOH-NH_3, an effective flame retardant finish for lightweight goods, Southern Regional Research Center discovered that conventional THPOH solutions tended to release formaldehyde and required excessive ammonia gas during curing. The conventional THPOH solution contained tetrakis (hydroxy methyl) phosphonium chloride (Thpc) and aqueous sodium hydroxide. Modification of the pad bath by substituting sodium sulfite for sodium hydroxide was a way to reduce the amount of formaldehyde released. Liquid ammonia or nonaqueous solutions of ammonia substituted for gaseous ammonia helped to reduce the amount of free ammonia in the work area during curing.

17-0012
FLAME RETARDANTS
(Market)

Anon
MARKET STUDY ON FLAME RETARDANTS PREDICTS SALES OF $570 MILLION
Text. Chem. Color. 7 (4): 10,12 (1975)

New 162-page report, "Fire Retardant Chemicals," from Frost & Sullivan, Inc., predicts a market of $570 million for fire retardant compounds by 1983. The seven major end-use markets (construction, electrical equipment, carpets and rugs, apparel, home furnishings, transportation, and nonwovens) should consume 750 million pounds of fire retardant chemicals by 1978, an increase of 300 million pounds over 1973. Fire retardant treatment may reach 100% in some apparel markets by 1983, and from 50-85% in home furnishings and bedding.

See: 17-0007, Brominated Biphenyls

*17-0013
FLUOROCARBONS

Speizer, Frank E. et al
PALPITATION RATES ASSOCIATED WITH FLUOROCARBON EXPOSURE IN A HOSPITAL SETTING
New. Eng. J. Med. 292 (12): 624-26 (March 20, 1975)

Interviews indicate that all second- and third-year pathology residents in a Boston hospital had experienced palpitations, some serious enough to prompt four residents to have electrocardiograms.

Hospital workers using fluorocarbons in their work, and other workers, are advised to seek substitute materials and seek suitable ventilation.

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*17-0014
FLUOROCARBONS

Anon
SCIENCE
Chem. Eng. 53 (13): 14 (March 31, 1975)

NASA, NSF, EPA, and the National Oceanic and Atmospheric Administration will finance a National Research Council panel to study the potential effects on the stratosphere of chlorofluorocarbons and other pollutants.

Anon
PLAZE, INC: BALANCING THE SCALES. . .
Aerosol Age 20 (3): 12-3 (March 1975)

John H. Ferring, president of Plaze Inc., is running ads to urge the public not to panic on the "ozone" theory but to wait for the facts. One suggested substitute for Propellant 12/11 is isobutane, but it is flammable.

Anon
ANESTHETIC CHALLENGED
Chem. Week 116 (14): 21 (April 2, 1975)

Six-month-old mice, who had been exposed to 0.1% isoflurane on alternate days for 25 two-hour exposures, had double or triple the number of lung cancers found in controls. Three months later, the treated mice had three to five times as many lung cancers. Other findings were three liver tumors and a uterine malignancy. Treated mice were offsprings of mice exposed to varying concentrations of isoflurane, an alpha-chloroether anesthetic developed by Ohio Medical Products. The company is awaiting FDA approval to use isoflurane.

17-0017
HEXACHLOROBENZENE

Fields, Ellis K.
HEXACHLOROBENZENE (Letter to Editor)
Chem. Eng. News 53 (12): 5 (March 24, 1975)

Responding to a recent report on the wide distribution in the oceans of hexachlorobenzene (See: CATS 14-0017), the writer refers to his co-authored study of mass spectral, thermal, and photochemical reactions of hexachlorobenzene [preprint, ACS Div. Petroleum Chem. (Vol. 18, No. 1, p. 148)]. Among other results, he found the compound to be stable thermally but highly reactive photochemically, and suggests that hexachlorobenzene may disappear from the oceans by the action of sunlight, providing that contamination does not continue on a broad scale.

17-0018
HEXACHLOROBENZENE

Mehendale, Harihara M. et al
METABOLISM AND EFFECTS OF HEXACHLOROBENZENE ON HEPATIC MICROSOMAL ENZYMES IN THE RAT
J. Agr. Food Chem. 23 (2): 261-5 (March-April 1975)

Rats, who had been given a single oral dose (5 mg/kg) of hexachlorobenzene (HCB) retained most of the dose in major body organs and tissues, excreting less than 1% in the urine and about 16% in the feces, seven days later. Three known and four unknown metabolites of HCB were detected in the urine. Although urinary coproporphyrin levels increased, there was no significant evidence of porphyria.

Earlier studies indicate that HCB has a low acute toxicity to mammals, but causes skin rashes and extreme sensitivity to sunlight. Some evidence points to ecological magnification of residues of HCB, with residues reported in birds, beef cattle, humans and rabbits.

See also: 17-0034, Vinyl Chloride

Anon
HYDRAZINE FOR BOILER PROTECTION
Anti-Corros. Methods Mater. 21 (12): 4,5,17 (Dec. 1974)

Brief discussion of the use and control of hydrazine as a method of protection against corrosion in boilers.

See: 17-0006, Acrylonitrile

Anon
PROBING ENERGY'S FEEDSTOCK ROLE
Chem. Week 116 (13): 44 (March 26, 1975)

Economics work against the probability of liquefaction and gasification of coal as a low-cost source of feedstocks for many years ahead.

17-0021
LIQUEFACTION AND GASIFICATION OF COAL

Reynolds, W.W. and Klein, H.S.
PETROCHEMICALS AND ENERGY IN PERSPECTIVE
Chem. Eng. Progr. 71 (3): 9-16 (March 1975)

An energy "budget", developed to assess availability of petrochemical feedstocks through 1990, balances future energy demand against predicted supply. The anticipated 5 to 7%/year growth rate for petrochemicals can be met without much dependence on coal gasification and liquefaction, but some gasification plants may be built to satisfy local imbalances. Costs of synthesizing chemicals from coal are compared with those of petroleum and natural gas processes, using as examples vinyl chloride from acetylene and synthesis gas chemistry.

Anon
AROMATICS SUPPLY OUTLOOK IS GOOD
Chem. Eng. 53 (13): 10 (March 31, 1975)

Supply of aromatics now is high and they should remain available in late 1970's and early 1980's. Availability of benzene during next 10 years should increase by 80%. Coal may prove a big source of aromatics, but not much by 1985. Coal-derived benzene may increase from about 100 million gal. (coke oven light oil) in 1974 to about 350 million gal. from all coal sources, including gasification, in 1985.

Anon
NEW PROCESSES EYED FOR ETHYLENE GLYCOL
Chem. Eng. 53 (13): 10-11 (Mar. 31, 1975)

Synthesis gas (carbon monoxide and hydrogen) from coal gasification by 1980 may prove a more economical and attractive route to manufacture of ethylene glycol than acetoxylation. The latter is now on the threshold of actual use. Cost comparisons are given.

17-0024
LIQUEFACTION AND GASIFICATION OF COAL

Anon
BILLION-DOLLAR COAL GAS PROJECT PLANNED BY ANGS
Chem. Week 116 (14): 13 (April 2, 1975)

American Natural Gas System wants the Federal Power Commission to move up on permit procedures so that its planned $780-million, 91-billion-cu ft/yr coal gasification plant near Beulah, ND, and its associated $125-million lignite mine can be in operation by 1981.

17-0025
LIQUEFACTION AND GASIFICATION OF COAL

Sternberg, Heinz W. et al
ACID-BASE STRUCTURE OF COAL-DERIVED ASPHALTENES
Science 188 (4183): 49-51 (April 4, 1975)

Asphaltenes, key intermediates in bituminous coal liquefaction, have an acid-base structure. The acidic and basic components have been separated and their essential features are described. Only the acidic components contain all of the exchangeable protons present. This finding suggests that coal may also have an acid-base structure.

17-0026
MODEL ECOSYSTEMS

Metcalf, Robert L. et al
MODEL ECOSYSTEM STUDIES OF THE ENVIRONMENTAL FATE OF SIX ORGANOCHLORINE PESTICIDES
Environ. Health Perspect. (4): 35-44 (June 1973)

Despite more than 20 years of intensive use there are major uncertainties about the environmental distribution and degradative fate of the various organochlorine pesticides in food web organisms. The problem is both controversial and momentous, as 88,641,000 pounds of cyclodienes and toxaphene and 59,316,000 pounds of DDT were produced in the United States in 1970 *(1)*. The laboratory model ecosystem devised in this laboratory *(2)* has been used to estimate the comparative environmental properties of DDT, methoxychlor, and other DDT analogs *(3-5)*. These investigations have demonstrated environmental degradative pathways and have provided quantitative data on ecological magnification and biodegradability index *(6)*. This paper presents data on six additional organochlorine pesticides which should be of value in judging their overall effects on environmental quality. Furthermore, the data provide a realistic background of the environmental toxicology of standard substances against which screening data for new candidate pesticides can be weighed.

17-0027
MODEL ECOSYSTEMS

Yu, Ching-Chieh et al
FATE OF PYRAZON IN A MODEL ECOSYSTEM
J. Agr. Food Chem. 23 (2): 309 (March-April 1975)

The concentration, metabolites, and degradation products of pyrazon were determined in algae, clam, crab and several other organisms in a model ecosystem. The highest concentration of combined parent compound and metabolites (0.6 ppm) were detected in the crab; the lowest (0.06 ppm) in fish. Apparently, pyrazon was degraded slowly in water. Its degradation products dc not appear to be magnified in the food chain.

Davis, Richard C.
SYNTHETIC DETERGENTS: WASHER-DETERGENT-TEXTILE INTERACTIONS
Hydrocarbon Process. 3, 90-2 (March 1975)

In one of seven papers reviewing the 1975 status of synthetic detergents (pp. 71-92 of this issue), the author claims that by 1980 our mostly synthetic fiber clothing will be washed with a totally biodegradable and organic nonionic liquid detergent in 40°C water. The ultimate solution to a proper sequestrant may be an ion exchange softener. Several have been tried without success, including nitrilotriacetate (NTA), a petrochemical product that seemed promising until its limited use was stopped by the U.S. Attorney General.

HAAS, J.M. et al
ENVIRONMENTAL GUIDE TO DYE CARRIER SELECTION
Amer. Dyest. Rep. 64 (3): 34,36,49 (March 1975)

Data on biodegradation, fish toxicity, vapor pressure, and other physical properties were determined for four classes of dye carriers (biphenyl compounds, coal tar base alkyl naphthalenes, oxygenated compounds, and chlorinated hydrocarbons, including perchloroethylene).

Belisle, Andre A. et al
ANALYSIS OF TISSUES OF MALLARD DUCKS FED TWO PHTHALATE ESTERS
Bull. Environ. Contam. Toxicol. 13 (2): 129-32 (Feb. 1975)

An analytical technique developed to determine dibutyl phthalate (DBP) and diethylhexyl phthalate (DEHP) in animal tissue was used to analyze tissues of mallard ducks fed diets containing 10 ppm of DBP or DEHP. Analysis of the tissues at the end of 5 months showed no DBP to be present and only ≤0.15 ppm of DEHP in the lung and breast muscles.

17-0031
POLYURETHANES
(Market)

Anon
URETHANE '75
Chem. Week 116 (13): 25-36 (March 26, 1975)

Review of 1974 and outlook for 1975 markets, showing principal market areas, growth-shaping factors, etc.

17-0032
POLYURETHANES
(Uses)

Anon
A CAST-POLYURETHANE TIRE BOASTING. . .
Chem. Eng. 82 (7): 50 (March 31, 1975)

Polyair of Austria wants to license its method for making a low-cost cast-polyurethane tire which is said to have good road properties and long service life. The Soviet Union has already signed a license agreement.

17-0033
VINYL CHLORIDE

Anon
PLASTICS -- RAW MATERIALS TO END MARKET. . .
Chem. Eng. 82 (7): 12 (March 31, 1975)

Paperback copies of the proceedings of two symposia held in April 1974, entitled "Plastics-Raw Materials to End Markets and Coatings-New Technology and Markets," are available at $9.95 from the Chemical Marketing and Economics Division, ACS, P. O. Box 170, Brooklyn, NY, 11209. Includes market reviews and forecasts for PVC, polystyrene, polyesters, and resins.

17-0034
VINYL CHLORIDE

Anon
MINIMIZING DEAD-END WASTES
Chem. Eng. 82 (7): 60-2 (March 31, 1975)

At a recent Washington conference, representatives from government and the chemical process industries offered ideas on using the sludges resulting from chemical and pollution-abatement processes.

17-0035
VINYL CHLORIDE

Anon
WHAT KIND OF TESTS?
Chem. Week 116 (14): 19 (April 2, 1975)

Methods of testing commercial chemicals was a big question at recent Conference on Occupational Carcinogenesis, sponsored by New York Academy of Sciences, NYC. Following the incidence of reported cancers among workers at the neighboring B.F. Goodrich polyvinyl chloride unit, DuPont undertook a health study of workers, including retirees, in its own neoprene plant, discovering in the process that the Soviets had reported cancer among employees of neoprene and chloroprene plants. Benzoyl (benzyl?) chloride, cadmium, and various rubber and chemical products used in tire manufacturing are also carcinogenic "suspects".

Microorganisms are suggested as useful in singling out chemicals that should have top priority in more definitive testing for carcinogenicity, and there are resources available for mutagenic screening via animal tests, with mutagenicity serving as an indicator of carcinogenicity.

17-0036
VINYL CHLORIDE

Anon
NEW VCM INGESTION STUDIES IN ITALY BEGUN AT A LOWER RATE
Chem. Week 116 (14): 36 (April 2, 1975)

Reporting that the earlier levels of VCM fed to rats were too high, Cesare Maltoni plans new studies to determine if ingested VCM is carcinogenic. New levels will be 1, 0.3, and 0.03 mg/kg of the animal's body weight.

17-0037
VINYL CHLORIDE

Anon
RESPIRATOR CHANGE IN VINYL CHLORIDE REGS
Hydrocarbon Process. 3: 17 (March 1975)

Omitted from OSHA's permanent job-health rule of October 1974 were certain air respirators required to protect workers from potentially carcinogenic VC. The amended regulations now include the Type C supplied air respirator for use in areas containing no more than 1000 ppm VC.

VINYL CHLORIDE

See: 17-0004, Arsenic

See: 17-0003, Acrylonitrile

See: 17-0021, Liquefaction and Gasification of Coal

17-0038
GENERAL INFORMATION

Anon
CONTROLLED DESTRUCTION OF TOXIC VAPORS. . .
Chem. Week 116 (13): 49-50 (March 26, 1975)

A microwave technique for the controlled destruction of toxic vapors and liquids, described by L. J. Bailin, et al (Environmental Science and Technology, March 1975), looks promising for large-scale decomposition of waste insecticides and hard-to-dispose hazardous wastes.

17-0039
GENERAL INFORMATION

Wellings, F.M. et al
PATHOGENIC VIRUSES MAY THWART LAND DISPOSAL
Water & Waste Eng. 12 (3): 70,72-4 (1975)

Because of complex test procedures little research has been done on the possibly hazardous build-up of pathogens in soil and groundwater. The potential of viruses to cause disease in man indicates that secondary wastewater spray irrigation must be recognized as a hazard.

17-0040
GENERAL INFORMATION

Anon
RAT POISON DOES DEED IN ONLY ONE FEEDING
Chem. Eng. 53 (12): 8 (March 24, 1975)

A new Vacor rodenticide from Rohm & Haas, so toxic that it will kill rats in one feeding, will be on sale as of April 1. Its chemical name is N-3-pyridylmethyl-N'-p-nitrophenyl urea.

17-0041
GENERAL INFORMATION

Anon
HAIR DYES UNSAFE?
Chem. Week 116 (13): 38 (March 26, 1975)

Hair colorants have shown some mutagenic effects on bacteria and may be "suspect" carcinogens. Among chemicals tested: 2,4-diaminoanisole, *m*-phenylenediamine, 2-nitro-*p*-phenylene diamine, and 4-nitro-*o*-phenylenediamine. FDA has not reversed its decision that hair dyes are safe.

17-0042
GENERAL INFORMATION

Anon
FDA IS BACKING DOWN ON CYCLAMATES
Chem. Eng. 53 (12): 9 (March 24, 1975)

FDA has canceled its request for additional animal studies with cyclamates; wants NCI panel to review available information on carcinogenic potential of the sweetener.

17-0043
GENERAL INFORMATION

Anon
CAHNGE URGED IN EPA REGULATORY PROCESS
Chem. Eng. 53 (12): 18 (March 24, 1975)

NAS steering committee study may result in EPA's becoming a model to show how the government's regulatory process should work. NAS has a $5 million contract from EPA to study the entire regulatory process.

17-0044
GENERAL INFORMATION

Anon
FDA ON RED No. 2
Happi 12 (3): 8 (March 1975)

An ad hoc committee has recommended that FDA put a 2 mg/kg/person/day or 150 mg/person/day limit on FD&C No. 2, even though the color is deemed safe. Lack of information on its metabolic rate is the reason given for the proposed limit.

17-0045
GENERAL INFORMATION

Fries, George F. and Marrow, George S.
RETENTION AND EXCRETION OF 2,3,7,8-TETRACHLORODIBENZO-*p*-DIOXIN BY RATS
J. Agr. Food Chem. 23 (2): 265-9 (March-April 1975)

Interest in the potential health hazards of chlorinated dibenzo-p-dioxins has centered on 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), a compound with a very low single-dose oral LD_{50}, after it appeared as a trace contaminant in the herbicide 2,4,5-T. In this study, rats were fed diets containing 7 or 20 ppb of TCDD for 42 days and then were fed TCDD-free diets for another 28 days. Male rats on the 20 ppb diet ingested TCDD at a level three times higher than the LD_{50} dose, but all survived until sacrificed. At the 20 ppb level, male and female rats ate less feed; at the 7 ppb level, males ate less for the first 14 days. Shortly after the TCDD diets were stopped, feed consumption improved. The 7 ppb diet caused a greater increase in liver weight than did the 20 ppb diet. Males retained 85% of TCDD in the liver; females, 70%. Whole body (including liver) retention was proportional to total intake. Retention, estimated at steady state, was 10 to 11 times the daily intake. When feeding of TCDD stopped, total body elimination of TCDD, expressed in halve-lives, was 12 days for males and 15 days for females.

17-0046
GENERAL INFORMATION

Anon
TIGHTER RESTRICTIONS. . .
Chem. Week 116 (13): 10 (March 26, 1975)

EPA's concern about the potential health hazards of sulfates from catalytic converters on automobiles has caused Senator Muskie and others in Congress to question sulfate emissions from power plants and other sources. Congress may now not be too willing to approve any delay of the time limits for smelters, sulfuric acid plants, and related industries to install controls or for EPA to enforce emissions regulations.

17-0047
GENERAL INFORMATION

Anon
REGULATIONS GOVERNING. . .
Chem. Week 116 (13): 10 (March 26, 1975)

Although three judges of the U.S. Court of Appeals, Washington, DC, recently ruled on a 2-1 vote that EPA had not offered enough proof that lead in gasoline was a health hazard, all nine judges will review the case later. Thus, EPA has another chance to push for regulations to reduce the lead content of gasoline.

17-0048
GENERAL INFORMATION

Faggan, Joseph E.
OCTANE IMPROVER (Letter to Editor)
Chem. Eng. 82 (7): 5 (March 31, 1975)

Refuting claim that MMT, suggested as a lead-free antiknock substitute for TEL, may be a potential health hazard (See: CATS 8-0047), the author claims that manganese is a trace element essential for humans and that large-scale use of MMT would only add 0.75 μg/day to man's total intake of about 2400 μg from food, 5 μg from water and 2 μg from air.

In response, the editor claims that unlike manganese, MMT and its combustion products are not essential to life. Inhalation of a chemical causes effects different from those of swallowing the same chemical. So, on an air basis, man might increase his manganese intake by about 40%, if MMT were used on a large-scale.

17-0049
GENERAL INFORMATION

Willums, Jan-Olaf
NEW CONCEPTS IN AIR POLLUTION RESEARCH
Chem. Eng. 82 (7): 12 (March 31, 1975)

Published by Halstead Press, div. of Wiley, NYC, at $11.95, this paperback book covers the effects of air pollution on climate, vegetation, priceless art, and traffic safety; transport and removal of air pollutants; photochemical factors; international legal and socio-economic considerations; and techniques of pollutant monitoring and analysis.

17-0050
GENERAL INFORMATION

Anon
A DECISION. . .
Chem. Eng. 53 (13): 7 (March 31, 1975)

EPA will soon decide if the Air Force can incinerate 2.5 million gallons of Herbicide Orange weed killer (a 50/50 mixture of 2,4,5-T and 2,4-D) in the mid-Pacific area. If the Air Force decides on chemical reprocessing of the weed killer to achieve a marketable pesticide or industrial chemical, EPA approval would also be necessary.

17-0051
GENERAL INFORMATION

Anon
A NEW STUDY OF EFFECTS OF OIL SPILLS. . .
Chem. Eng. 53 (13): 14 (March 31, 1975)

Skidaway Institute of Oceanography, Savannah, Ga., has an API contract to study the effects of oil spills on marine life. Skidaway will x-ray thin samples of sediment from the site of a 1969 oil spill in Buzzards Bay, Mass., and then study relief casts of the samples.

17-0052
GENERAL INFORMATION

Anon
ENVIRONMENTAL MONITORING SYMPOSIUM
Environ. Rept. 5 (22): 175 (March 18, 1975)

EPA, WHO, and the University of Nevada are co-sponsoring an International Symposium on Environmental Monitoring in Las Vegas on 14-19 September, emphasizing health-related contaminants and environmental quality assessment techniques. Pesticides, particulates, heavy metals and other toxic materials will be discussed.

17-0053
GENERAL INFORMATION
(New Product)

Anon
AN ELASTOMER FOR ALL SEASONS
Chem. Week 116 (14): 33 (April 2, 1975)

Phosphazene rubber, a new inorganic elastomer flexible over wide temperature range, now announced by Firestone, is seen as the commercial forerunner for other polyphosphazenes. The new product, a phosphonitrilic fluoroelastomer, can operate safely in a fire environment, and may eventually replace urethane foam in traditional uses.

17-0054
GENERAL INFORMATION

Peil, K.M. and Gaudy, A.F., Jr,
A RATIONAL APPROACH FOR PREDICTING THE DISSOLVED OXYGEN PROFILE IN RECEIVING WATERS
Biotechnol. Bioeng. 17 (1): 69-84 (1975)

The described method for predicting the dissolved oxygen (DO) profile in a stream receiving biodegradable waste proved to be fairly accurate. The open jug technique was used to obtain the BOD curve, which was used in numerical integration with the physical reaeration data for the receiving stream to predict the DO profile.

17-0055
GENERAL INFORMATION

Beattie, A.D. et al
ROLE OF CHRONIC LOW-LEVEL LEAD EXPOSURE IN THE AETIOLOGY OF MENTAL RETARDATION
Lancet 1 (7907): 589-92 (March 15, 1975)

Water-lead content was significantly higher in homes (in Glasgow, Scotland) of 77 mentally retarded children aged two to six years than in the homes of controls. More retarded children came from homes where the lead concentrations in water were higher than 800 µg/liter. The retarded children had higher blood-lead levels. Thus, lead contamination of water may be a factor in mental retardation and efforts to reduce the lead content of drinking-water are urged.

17-0056
GENERAL INFORMATION

Anon
ROTTEN NEWS FOR APPLE EXPORTERS
Science News 107 (13): 210 (March 29, 1975)

Canadian Dept. of Agriculture researchers report that apple tissues retained bromide residues, when the apples were treated with ethylene dibromide, an effective fumigant for European red mites. Both inorganic and organic bromide residues were reported two weeks after fumigation. In humans high concentrations of organic bromide compounds are known to cause tissue mutations.

17-0057
GENERAL INFORMATION

Northup, Harold J. and Turner, William F.
AIR POLLUTION CONTROL IN TEXTILE FINISHING
Text. Chem. Color. 7 (4): 22/60-26/64 (1975)

Air pollution problems associated with textile finishing are reviewed briefly and methods of abatement are discussed. These include various control devices or changes in the processes used. Ways of predicting the concentration of pollutants in stack emissions for a proposed finishing process are presented.

17-0058
GENERAL INFORMATION

Piper, D.Z. and Codispoti, L.A.
MARINE PHOSPHORITE DEPOSITS AND THE NITROGEN CYCLE
Science 188 (4183): 15-18 (Apr. 4, 1975)

Attempt to demonstrate a possible relationship between phosphorite deposition and an increase in marine denitrification indicates correlations that suggest additional research needed to study effects of possible changes in the rate of denitrification within ancient oceans on the extinctions of marine organisms, variations in the overall level of biological activity, and other factors.

17-0059
GENERAL INFORMATION

Blumer, M. and Youngblood, W.W.
POLYCYCLIC AROMATIC HYDROCARBONS IN SOILS AND RECENT SEDIMENTS
Science 188 (4183): 53-5 (April 4, 1975)

The polycyclic aromatic hydrocarbons (PAH) found in soils and young marine sediments contain complex PAH assemblages. In addition to such previously determined carcinogens as benzo[a]pyrene and benz[a]anthracene, the sediments contain dibenzothiophene, methylchrysenes and other carcinogens. It is suggested that the environmental toxicology of the sedimentary PAH fraction be examined. Apparently, the hydrocarbons are formed in natural fires, dispersed and mixed by air transport, and are then deposited into surface sediments.

17-0060
GENERAL INFORMATION

Snipes, Wallace et al
BUTYLATED HYDROXYTOLUENE INACTIVATES LIPID-CONTAINING VIRUSES
Science 188 (4183): 64-6 (April 4, 1975)

Butylated hydroxytoluene (BHT), an antioxidant widely used as a food preservative, is reported now as an effective inactivator of lipid-containing mammalian and bacterial viruses. Among other things, previous studies indicate that BHT reduces chemical carcinogenesis and, in some cases, retards aging in mice.

18-0001
ACRYLONITRILE

Anon
WOODFIBRES CAN BE EASILY MODIFIED. . .
Can. Chem. Proc. 59 (3): 6,8 (1975)

Wood fibers can be easily modified with acrylonitrile to form a copolymer that soaks up to 30 times its own weight, according to the Pulp and Paper Research Institute of Canada. The grafting of acrylonitrile onto cellulose molecules takes place at room temperature in 15 minutes or less. The three main steps of the process are described briefly. Possible uses for the nitrile pulp: adsorbent material in diapers, surgical dressings, etc. As a gel, the new copolymer may be a good thickening agent for cosmetics and oil-well drilling muds, if some problems of viscosity stability can be worked out.

18-0002
ACRYLONITRILE

Collins, George L. and Thomas, Norman W.
INFLUENCE OF CATION ON THE ELECTROPOLYMERIZATION OF ACRYLONITRILE
J. Polymer Sci. (Polym. Letters Ed.) 13 (2): 73-8 (1975)

The cathodic reduction of acrylonitrile has long interested electroorganic chemists. This paper adds information on the counter-ion influence on the electropolymerization of acrylonitrile by examining the differences between the effects of tetraalkylammonium salts and tetraarylphosphonium salts on the formation of polyacrylonitrile at the metal cathode of an undivided electrochemical cell.

18-0003
ARSENIC

Hultman, Carl A. and Rosenblatt, Gerd M.
VAPORIZATION OF SOLIDS: EVIDENCE FOR A ZIPPER MECHANISM IN THE RETARDED VAPORIZATION OF ARSENIC
Science 188 (4184) 145-7 (Apr. 11, 1975)

A "zipper," or unraveling, mechanism is presented to show how the evaporation of elemental arsenic occurs. Evidently, the rate of evaporation is determined by kink initiation, occurring at emergent screw locations. The kink advances, as a slider on a zipper, along the ledge releasing As_4 molecules as it advances.

18-0004
ARSENIC

Whitnack, Gerald C.
SINGLE-SWEEP POLAROGRAPHIC TECHNIQUES USEFUL IN MICROPOLLUTION STUDIES OF GROUND AND SURFACE WATERS
Anal. Chem. 47 (4): 618-21 (1975)

Single-sweep polarographic techniques, developed at the Naval Weapons Center, China Lake, California, has successfully detected and analyzed inorganic and organic micropollutants in ground and surface waters. Possible methods of analysis are described for the soluble ionic species of chromium, arsenic, and iodine, and for traces of explosives and plasticizers (e.g., TNT, diethyl phthate, dibutyl sebacate) in water.

18-0005
ARSENIC

Anon
FINNISH OIL FIRM. . .
Chem. Eng. 82 (8): 33 (Apr. 14, 1975)

Neste Oy, Finland, planned to dump 7 tons of arsenic wastes from its refinery into the Atlantic off western Africa, but the operation was halted when Brazil, Argentina, Nigeria, and the Ivory Coast lodged a formal protest with the International Maritime Conference. Apparently, the waste material will go back to Finland.

18-0006
ARSENIC

Anon
INORGANIC ARSENIC STANDARDS CRITICIZED
Chem. Eng. News 53 (15): 5 (Apr. 14, 1975)

NIOSH claims that proposed federal standards for worker exposure to inorganic arsenic are too lenient to prevent cancer development in workers. NIOSH now suggests lowering exposure limits to 0.002 mg/cu m of air over any 15-minute period instead of the 0.05 mg/cu m now in effect. About 1.5 million workers believed to be exposed to inorganic arsenic, primarily in plants producing arsenic compounds for herbicides, pesticides, non-ferrous alloys, wood preservatives, and in glass manufacturing and smelting plants.

*18-0007
ASBESTOS

Gross, Paul et al
INGESTED MINERAL FIBERS. DO THEY PENETRATE TISSUE OR CAUSE CANCER?
Arch. Environ. Health 29 (6): 341-7 (Dec. 1974)

In several different studies, rats were fed butter and other foodstuffs containing asbestos fibers (chrysotile, amosite, etc.). Even in long-term experiments, there was no evidence that the fibers had penetrated into the rat tissues. Similarly, coal miners, known to swallow about 100 times the dust stored in their lungs, have not been found to have fibers in their intestinal walls or mesenteric lymph nodes

Anon
NOW IT'S COMPULSORY
Chem. Week 116 (16): 14 (Apr. 16, 1975)

Flame-retardant chemicals, household aerosols, dishwasher detergents and other product categories are among those for which the Consumer Product Safety Commission is demanding formulas. Because industry did not answer a voluntary call for formulas of 21,000 consumer products, the CPSC will order companies to divulge the formulas by May 15 so that the "potential or real hazard" of product ingredients may be assessed.

*18-0009
FLUOROCARBONS

Anon
OZONE AEROSOL BILLS INTRODUCED TO CONGRESS
Soap Cosmet. Chem. Spec. 51 (3): 22 (1975)

Congressman Paul G. Rogers has introduced a bill, identified as the "Ozone Protection Act of 1975," aimed at determining the effects on public health and environment of discharging fluorocarbons into the atmosphere and determining ways of recovering and recycling chlorofluoromethane from consumer products.

A bill introduced by Congressman Les Aspin would set a quantitative limit on the production or import of chlorofluoromethanes.

Meanwhile, industry has established a Council on Atmospheric Science (COAS), as a counterpart to the Federal Interagency Task Force on Inadvertent Modification of the Stratosphere (IMOS), to coordinate industry's factors affected by the ozone/fluorocarbon issue.

*18-0010
FLUOROCARBONS

Anon
RESEARCHERS MEET TO HELP CLEAR THE AIR
Chem. Week 116 (16): 32 (Apr. 16, 1975)

Environment, energy and raw materials were topics at Am. Chemical Society Meeting in Philadelphia. Researchers disagreed on the potential dangers to the protective stratospheric ozone from chlorinated fluorocarbons, with one suggesting that no laws be passed until after a three-year period.

Spraying diethylhydroxylamine into the atmosphere could be a way to fight photochemical smog by providing a more effective and less harmful means of reducing auto pollution than catalytic converters, according to J. Heicklen of Penn State Univ. Toxicological studies indicate diethylhydroxylamine to be safe in atmospheric concentrations as high as 100 ppm.

A new potential danger, pointed out by Heicklen, is that from the use in the drycleaning industry of chlorinated ethylenes, which may break down to phosgene and other harmful chemicals in the air.

*18-0011
FLUOROCARBONS

Anon
SATELLITE WILL MONITOR CHLORINE BUILDUP IN STRATOSPHERE
Chem. Week 116 (15): 31 (Apr. 9, 1975)

An earth satellite launched in 1972 will monitor chlorine buildup in the stratosphere to provide data for determining the ozone depleting effect of chlorine. Also, in its report, "Environmental Impact of Stratospheric Flight," the NAS urges international agreements for controlling flights of sub- and supersonic aircraft. Ozone depletion, plus surface temperature and rainfall changes, might result from combinations of sulfur and nitrogen oxide emissions from craft using high-sulfur fuel.

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*18-0012
FLUOROCARBONS

Hammond, Allen L.
OZONE DESTRUCTION: PROBLEM'S SCOPE GROWS, ITS URGENCY RECEDES
Science 187 (4182): 1181-3 (Mar. 28. 1975)

Although predictions of the ozone destruction to be anticipated from a given concentration of pollutants are being revised downward on the basis of new laboratory measurements, other studies indicate that the amount of halomethanes in the atmosphere seems to be increasing. Methyl chloride (CH_3Cl) and carbon tetrachloride (CCl_4) are reported in the atmosphere and they may be contributing free chlorine to the stratosphere in addition to that formed from various fluorocarbons. In addition, some studies are now underway on the presence of free bromine in the stratosphere, probably from methyl bromide. The lack of any demonstrated hazard from bromine does not preclude the need for determining more carefully how, and in what form, bromine and chlorine are used in human activities.

*18-0013
FLUOROCARBONS

Anon
EVIDENCE OF DANGER. . .
Chem. Eng. News 53 (15): 7 (Apr. 14, 1975)

From an 18-month study, the Consumer Product Safety Commission did not find enough evidence of danger from aerosol sprays containing chlorofluorocarbon propellants to justify warning the consuming public to stop using them.

*18-0014
FLUOROCARBONS

Burton, J.L. et al
ATMOSPHERIC OZONE AND FEMORAL FRACTURES (Letter to Ed.)
Lancet 1 (7910): 795-6 (Apr. 5, 1975)

Another potential effect of the depletion of ozone in the stratosphere by freon from aerosols is the possibility of a decrease in the production of cholecalciferol by the skin. A decrease in the order of 20% might constitute a significant hazard to the elderly in terms of increased morbidity and mortality due to fractures of the femoral neck.

*18-0015
FLUOROCARBONS

Jaeger, Rudolph J. et al
SHORT-TERM INHALATION TOXICITY OF HALOGENATED HYDROCARBONS
Arch. Environ. Health 30 (1): 26-31 (1975)

Rats inhaled various concentrations of carbon tetrachloride, 2-chlorobutadiene (CBD), 1,1-dibromoethylene (DBE), 1,1-dichloroethylene (DCE), vinyl chloride (VCM), and 1,1-difluoroethylene (DFE) for four hours, after fasting for 18 hours. In addition, they were exposed to VCM in combination with DCE. Fasted rats were more sensitive to the hepatoxic effects of carbon tet, CBD, DBE, and DCE than were fed rats, but neither fasted nor fed rats showed any acute liver damage from VCM or DFE at any concentration. When administered with DCE, the VCM prevented the liver damage caused in fasted rats by inhalation of DCE, an effect that was concentration dependent.

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*18-0016
FLUOROCARBONS

Samara, G.A. and Fritz, I.J.
PRESSURE AND TEMPERATURE DEPENDENCE OF THE DIELECTRIC AND ULTRASONIC PROPERTIES OF POLYCHLOROTRIFLUOROETHYLENE (PCTFE)
J. Polym. Sci. (Polym. Letters Ed.) 13 (2): 93-9 (1975)

Some results reported on the relaxation phenomena in PCTFE as deduced from dielectric and ultrasonic measurements emphasize the usefulness of pressure as a complementary variable to temperature and frequency in the study of molecular relaxations in polymer. The absence of any pressure-induced or temperature induced phase transitions in PCTFE over wide temperature and pressure ranges contrasts sharply with the occurrence of four well-defined phases in poly(tetrafluoroethylene) (PTFE) in view of the fact that the conformations of the two polymers are similar.

*18-0017
FLUOROCARBONS

Lee, W.K. and Choy, C.L.
HEAT CAPACITY OF FLUOROPOLYMERS
J. Polym. Sci. (Polym. Physics Ed.) 13 (3): 619-35 (1975)

Measurement between 80 and 340°K of the heat capacities of poly(vinyl fluoride), poly(vinylidene fluoride), and polytrifluoroethylene are described. The results indicate the validity of the Tarasov model in accounting for the acoustical heat capacity of polymers. Glass transitions in poly(vinylidene fluoride) and polytrifluoroethylene were found to be at 228°K and 305°K, respectively.

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*18-0018
FLUOROCARBONS

Hicks, C.P. and C.L. Young
THE GAS-LIQUID CRITICAL PROPERTIES OF BINARY MIXTURES
Chem. Revs. 75 (2): 119-75 (Apr. 1975)

The measurement and prediction of gas-liquid critical properties is reviewed. Examples include a number of binary mixtures that contain perfluorocarbons.

*18-0019
FLUOROCARBONS

Rowland, F.S.
ROWLAND ANSWERS "NAGGING QUESTION" ON OZONE (Letter to Editor)
Soap Cosmet. Chem. Spec. 51 (3): 16, 110 (1975)

Responding to an editorial presented earlier, the author attempts to clarify questions about variations in the ozone layer, touching upon theories offered to explain the increase in the ozone layer between 1957 and 1970 and mentioning that the world ozone concentration began to decrease in 1970.

He adds that all of the predictions of chlorofluoromethane effects on ozone show a substantial delay (10 to 20 years) between use at ground level and appearance of the maximum effect in the high stratosphere. While predictions of possible ozone effects can be made at the 1% level, actual measurements of ozone concentrations are more difficult and less accurate.

FLUOROCARBONS

See: 18-0008, Flame Retardants

18-0020
ISOCYANATES
(Production)

Anon
ISOCYANATES
Chem. Eng. News 53 (15): 9 (Apr. 14, 1975)

Upjohn has completed the expansion of its isocyanates plant in La Porte, Texas, upping capacity 50% to 300 million lb/year. About 90% of this includes products based on PAPI or MDI.

18-0021
LIQUEFACTION AND GASIFICATION OF COAL

Anon
PROCESSES CONVERT COAL, WASTES TO LIQUID FUEL
Chem. Eng. News 53 (15): 17-8 (Apr. 14, 1975)

Various processes for converting coal to liquid fuel were discussed at recent ACS meeting. Bu Mines Method changes lignites to low-sulfur, low-ash oils; Garrett process adapts technology to organic waste disposal.

18-0022
LIQUEFACTION AND GASIFICATION OF COAL

Anon
PROSPECTS IMPROVE FOR GASIFYING COAL IN SITU
Chem. Eng. News 53 (15): 18-9 (Apr. 14, 1975)

Discussed at recent ACS meeting: the possibility of stabilized prospects for in situ gasification of coal. Results at Bu Mines in Hanna, Wyoming, indicate that technology at hand is sufficient to produce a low-Btu gas from shallow (less than 1000 feet deep) deposits of bituminous, subbituminous, and lignitic coals.

Anon
CLEARER STANDARDS FOR MOCA SOUGHT
Chem. Eng. News 53 (14): 6 (Apr. 7, 1975)

OSHA held a second round of public hearings in attempt to clarify its work place standard for MOCA. Industry and unions agree that a standard is necessary to protect workers from the hazards associated with the chemical but are fighting "vagueness" of the proposed standard.

18-0024
MODEL ECOSYSTEMS

Anon
MODEL ECOSYSTEMS CAN BE USED. . .
Chem. Eng. News 53 (14): 17 (Apr. 7, 1975)

To predict the behavior of pesticides in the environment, EPA scientists turned to model ecosystems. At their Southeast Environmental Research laboratory in Atlanta, aquarium tanks simulate a typical farm pond in a cultivated watershed. The effects of 17 pesticides and five industrial chemicals on aquatic animals, plants, and insects were studied. Radiolabeled sorghum plants grown in the system allowed all elements of the system to be analyzed for radioactivity.

18-0025
MODEL ECOSYSTEMS

Yu, Ching-Chieh et al
FATE OF DICAMBA IN A MODEL ECOSYSTEM
Bull. Environ. Contam. Toxicol. 13 (3): 280-3 (1975)

A simple model ecosystem was used to study the fate of dicamba (2-methoxy-3,6-dichlorobenzoic acid). Although the metabolism of dicamba in plants and its transformation in soil has been reported, its fate in the food chain has not been. In this study, dicamba persisted in water in conjugated or in anionic forms, slowly transformed to 5-hydroxydicamba in water and was slowly decarboxylated. It did not magnify in food chain organisms.

See: *18-0010, Fluorocarbons

*18-0026
PHTHALATES
(Marketing)

Anon
IN PLASTICIZERS' FUTURE, FEW WORRIES ABOUT SUPPLY
Mod. Plast. 52 (4): 44-5 (1975)

Consumption of plasticizers is expected to drop 10% (to about 674,000 metric tons) in 1975 but producers are augmenting capacity for plasticizers and their feedstocks. New products are emerging and linear plasticizers are encroaching on DOP, DIOP, and DIDP. Consumption of the last three is expected to drop to 315,300 metric tons in 1975 versus 379,500 in 1973.

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*18-0027
PHTHALATES

Pfuderer, Peter and Francis, A.A.
PHTHALATE ESTERS: HEARTRATE DEPRESSORS IN THE GOLDFISH
Bull. Environ. Contam. Toxicol. 13 (3): 275-9 (1975)

In tests with goldfish, di-2-ethylhexyl phthalate, was not active, at the concentration used, during a 10-minute assay, but both di-n-butyl phthalate and benzylbutyl phthalate were active in lowering heartrate.

Heartrates lowered by the phthalates were returned almost to the resting level when the fish were put through two or more changes of fresh water. The phthalate esters probably affect the heartrate indirectly through the nervous system.

See: *18-0010, Fluorocarbons

Engelhardt, G. and Wallnöffer, P.R.
THE MICROBIAL METABOLISM OF DI-n-BUTYL PHTHALATE AND RELATED DIALKYL PHTHALATES
Bull. Environ. Contam. Toxicol. 13 (3): 342-7 (1975)

This study was undertaken to investigate the biodegradation of phthalate esters in the environment. Among the conclusions: microbial degradation of phthalate esters occurs much easier than that of the "classical" persistent organochlorine compounds.

18-0029
POLYURETHANES

DiSalvo, Anthony L. and Cornell, John H.
THERMAL DEGRADATION OF POLYURETHANES BY HEXAMETHYLDISILAZANE: SYNTHESES OF POLYHEXAMETHYLENEUREA WITH ORGANOSILICON REAGENTS
J. Polym. Sci. (Polym. Chem. Ed.) 13 (1): 97-104 (1975)

The nature of the polyurethane used governs the degradation results when aliphatic and aromatic polyurethanes are treated with hexamethyldisilazane at elevated temperatures. Examples are cited. In this study, two new routes to polyalkyleneureas are described and the reaction mechanism is discussed.

18-0030
POLYURETHANES

Hileman, F.D. et al
PYROLYSIS OF A FLEXIBLE URETHANE FOAM
J. Polym. Sci. (Polym. Chem. Ed) 13 (3): 571-84 (1975)

GCMS and chemical ionization mass spectroscopy were used to identify and quantify the pyrolysis products of a commercial flexible urethane foam pyrolyzed at 300, 500, 750, and 1000°C in an inert atmosphere. The methodology discussed will be applied to continuing studies of the foam degradation under oxidative degradation and flaming combustion conditions.

Chang, Yeong-Jen Peter and Wilkens, Garth L.
SUPERSTRUCTURE IN SEGMENTED POLYETHER-URETHANES
J. Polym. Sci. (Polym. Phys. Ed.) 13 (3): 455-76 (1975)

Systematic studies on the morphology of segmented polyurethanes are summarized. A series of segmented polyether-urethanes with systematically varied compositions with semicrystalline hard segments, which were not capable of hydrogen bonding, were studied. Another series, capable of hydrogen bonding, which had hard segment domains with a very low degree of crystallinity were also studied in regard to their superstructure and domain morphology. A detailed description of the results is presented. An idealized morphological model and the mechanism of anisotropic superstructure formation are offered.

See: *18-0010, Fluorocarbons

Anon
DOW SEEKS $42 MILLION FOR SHALE OIL RECOVERY
Chem. Week 116 (16): 33 (Apr. 16, 1975)

Dow seeks $42 million from ERDA for a 7-year study of the potential for oil recovery from the shale that underlies Michigan's lower peninsula. A 40,000 sq mi area may yield 2,500 billion bbls of shale oil. The shales in question have no water-leachable alkalis, so they may not cause the water pollution problems associated with Western shales. In situ retorting at 1000-ft depths is planned. Research will include ways to protect the environment.

18-0033
VINYL CHLORIDE

Abbas, K.B. and Thame,N.G.
THERMAL STABILITY OF GRAFT MODIFICATIONS OF PVC AND RELATED MATERIALS
J. Polym. Sci. (Polym. Chem. Ed.) 13 (1): 59-68 (1975)

Graft copolymers resulting from the use of alkylaluminum compounds to graft polyisobutylene and polybutadiene to PVC showed better thermal stability than unmodified PVC when measured after 0.4% degradation. High heat stability resulted when toluene was alkylated with PVC. Improved thermal stability is credited to the presence of an induction period and/or lower dehydrochlorination rate. Without a cobalt cocatalyst, PVC grafted with polybutadiene showed autocatalytic behavior and lower stability than unmodified PVC.

18-0034
VINYL CHLORIDE

Johnson, F.A. and Radon, J.C.
EFFECT OF MOLECULAR RELAXATIONS ON THE FRACTURE BEHAVIOR OF POLY(VINYL CHLORIDE)
J. Polym. Sci. (Polym. Chem. Ed.) 13 (2): 495-516 (1975)

Three-point bend tests and Charpy impact tests were carried out on thick rigid PVC sheet at temperatures from -197° to 21°C to measure its fracture toughness. Fracture loads and values of "time to fracture" were obtained and fracture toughness was calculated. Test conditions and results are discussed. The three-point bend tests gave the highest level of fracture toughness at all temperatures; the full speed impact test, evaluated by the use of low-blow periodic time, gave the lowest values. Of interest is the discernible toughness peak noted at temperatures below the rubber region. An approximate energy method gave better values of fracture toughness. Static toughness, which correlated with fracture surface appearance, was higher than dynamic toughness, suggesting the presence of crack tip craze in the PVC.

18-0035
VYNYL CHLORIDE

Nakamura, Kunio
DYNAMIC MECHANICAL PROPERTIES OF PLASTICIZED POLY(VINYL CHLORIDE)
J. Polym. Sci. (Polym. Phys. Ed.) 13 (1): 137-49 (1975)

PVC with a weight average polymerization of 1100 blended with di(2-ethylhexyl) phthalate, tricresyl phosphate, and other commercial plasticizers was used in this study designed to investigate the dynamic mechanical properties of networks caused by supramolecular structures in the plasticized polymer and to explain the influence of plasticizer concentration and species on the broadening effect. The reduced variable treatment of Ninomiya and Ferry for solutions of crystalline polymers worked well, and the results are discussed in detail.

18-0036
VINYL CHLORIDE

Anon
VINYL CHLORIDE MAKERS MEET OSHA STANDARD
Chem. Eng. 53 (14): 4 (Apr. 7, 1975)

Despite earlier hue and cry, major manufacturers seem to be in compliance with OSHA's standards for the suspected carcinogen, vinyl chloride, and have not had to curtail production even at older plants to meet the standards. Cost of meeting OSHA's standards has not yet been determined.

Anon
UNUSUALLY LOW CONCENTRATIONS OF VINYL CHLORIDE. . .
Chem. Eng. 82 (8): 33 (Apr. 14, 1975)

By installing ventilation or vacuum systems at process spots where vinyl chloride most likely could be released and by mechanically tightening up its equipment train, Sweden's KemaNord has cut VC concentrations to 1.5 ppm, averaged over an 8-hr period in its older VC plant at Stockvik and in its new plant at Stenungsund. KemaNord is working to reduce concentrations to below 1 ppm, a drastic reduction from the 30 ppm usually present in the workplace before these changes were made.

VINYL CHLORIDE

See: *18-0015, Fluorocarbons

18-0038
GENERAL INFORMATION

Sliney, David H. et al
ENVIRONMENTAL HEALTH HAZARDS FROM HIGH-POWERED. INFRARED LASER DEVICES
Arch. Environ. Health 30 (4): 174-9 (1975)

High-power infrared lasers can cause skin and eye injury in workers exposed to the direct beam, which can also be a fire hazard when the output power is 1 kw or higher. Other hazards discussed here include those from the electrical apparatus used, noise from the laser, and toxic airborne contaminants (e.g., CO, sulfur hexafluoride, carbon disulfide, etc.) connected with fuels used for laser generation or resulting from laser operation. Additionally, when the beam interacts with metallic targets, other potentially toxic contaminants, such as cadmium oxide fume, are formed.

18-0039
GENERAL INFORMATION

Anon
WATER HYACINTHS--FROM NUISANCE TO POLLUTION SOLUTION
Chemistry 48 (4): 25 (1975)

NASA uses water hyacinths to remove pollutants in effluents from its technology laboratories in Bay St. Louis, Miss., and plans to subject the water hyacinths to anaerobic fermentation to produce a fuel similar to natural gas. Other studies are planned to determine potential of plants as animal feed and fertilizer.

18-0040
GENERAL INFORMATION

Powers, Marcelina B. et al
REPEATED TOPICAL APPLICATIONS OF 1,2,4-TRICHLOROBENZENE
Arch. Environ. Health 30 (4): 165-70 (1975)

The solvent, 1,2,4-trichlorobenzene, was applied to the inner surface of rabbits' ears 3 times/week for 39 weeks at three levels -- 5%, 25%, and 100%. Other rabbits were similarly treated with petroleum ether, while another group had hexachlorodiphenyloxide applied to their ears once a week for 4 weeks. The last group exhibited gross dermal responses characteristic of chloracne by the third week and more definite chloracne sumptoms by the fourth week. Rabbits treated with petroleum ether and with 5% 1,2,4-trichlorobenzene showed only slight redness, slight scaling, and desquamation. With the two higher levels of 1,2,4-trichlorobenzene rabbits showed moderate-to-severe irritation (erythema, severe scaling, desquamation, some hair loss, etc.) but no gross evidence of acneform dermatitis. At necropsy there were no meaningful visceral changes in the test animals.

18-0041
GENERAL INFORMATION

Sessa, William
AEROSOLS BLAMED FOR LIMITED VISIBILITY
California Air Resources Board Bull. 6 (3): 6-7 (Mar.-Apr. 1975)

Aerosols, rather than gaseous pollutants, are judged responsible for limited visibility in the South Coast Air Basin, California, according to recent study. Man-made aerosols are greater health hazards and visibility reducers than are primary aerosols.

18-0042
GENERAL INFORMATION

Mazumdar, Satl et al
AN EPIDEMIOLOGICAL STUDY OF EXPOSURE TO COAL TAR PITCH VOLATILES AMONG COKE OVEN WORKERS
JAPCA 25 (4): 382-9 (1975)

In a study by the Pennsylvania Dept. of Public Health, coke oven jobs were categorized into work areas in terms of exposure to coal tar pitch volatiles. An index of cumulative exposure was used to study the dose-response relationship between exposure and mortality from cancer, particularly lung cancer. Mortality data derived from a long-term study of steelworkers by University of Pittsburgh's Dept. of Biostatistics.

Coal tar pitch volatiles present in the different areas vary considerably, the highest concentration being found at the top of coke ovens. The development of cancer, particularly lung cancer, is related to the level of exposure and to the length of exposure time. Although more information is needed to clarify the effects of coke oven effluents on mortality, there is sufficient evidence of health hazards to warrant recommending that steps be taken to reduce the pollutant level.

18-0043
GENERAL INFORMATION

Proni, J.R. et al
ACOUSTIC OBSERVATIONS OF SUSPENDED PARTICULATE MATTER IN THE OCEAN
Nature 254 (5499): 413-5 (Apr. 3, 1975)

The feasibility of acoustic surveys of suspended sediments looks promising. Article describes the use of the 20-kHz LODAR echo-sounding system in observing oceanic suspended particulate matter (probably resulting from a dredging operation) acoustically.

Iammartino, Nicholas R.
PETROCHEMICALS SING TO ETHYLENE'S TUNE
Chem. Eng. 82 (9): 52-4 (Apr. 28, 1975)

Ethylene producers shifting to heavier feeds for new crackers will have an increasing effect on the production of such basic petrochemicals as propylene, butadiene and various aromatics. Mentioned in this discussion is acrylonitrile, a substance for which demand is predicted to grow by 10%/yr for the next 10 years or so. An even higher growth rate is possible, if full potential is realized for acrylamides and barrier resins. Used now for water/sewage treatment and as paper additives, acrylamides may find a huge market as agents for tertiary oil recovery. If barrier resins achieve a sizable use in the pressure-bottle market during the next 10 years, they would precipitate a demand for acrylonitrile beyond the current world capacity. Still a big market, and growing, are acrylic fibers, and increasing growth is seen for acrylonitrile-butadiene-styrene and acrylonitrile-butadiene resins. One possible obstacle: acrylonitrile producers face competition with fertilizer manufacturers for ammonia feedstock. Although acrylonitrile accounts for only a small percentage of total ammonia use, it is gaining faster than agricultural demands.

19-0002
ACRYLONITRILE
(Production)

Anon
WORLD'S LARGEST ACRYLONITRILE PLANT FOR MONSANTO
Chem. Week 116 (18): 15 (Apr. 30, 1975)

Badger will design, engineer and construct the world's largest acrylonitrile plant for Monsanto Company, Texas City, Texas. Scheduled for 1976 completion, the plant will more than double Monsanto's U.S. capacity to over one billion lbs/yr of acrylonitrile, which is used in acrylic fibers, ABS plastics, nylon, containers, etc.

19-0003
ARSENIC

Crecelius, Eric A. et al
GEOCHEMISTRIES OF ARSENIC, ANTIMONY, MERCURY, AND RELATED ELEMENTS IN SEDIMENTS OF PUGET SOUND
Environ. Sci. Technol. 9 (4): 325-33 (1975)

Arsenic and antimony, discharged in the waste waters from a copper smelter near Tacoma, Washington, and present in the stack dust; mercury discharged at up to 9 kg/day before 1970 and since then at about 0.1 kg/day from a mercury cell chlor-alkali plant in Bellingham; plus arsenic, antimony, mercury, and other trace metals from sewage treatment plants are entering Puget Sound and affecting the natural distributions of the elements in the surface sediments of the Sound. An arsenic budget shows that the sediments accumulate less than 30% of the arsenic entering Puget Sound; discharge to the Strait of Juan de Fuca is a sink for this arsenic. Over 82% of the mercury is associated with oxidizable organic matter; approximately 50% of the arsenic and antimony is associated with amorphous iron and aluminum compounds.

19-0004
ARSENIC

Pojasek, Robert B.
NPDES PERMITS AND WATER ANALYSES
Environ. Sci. Technol. 9 (4): 320-4 (1975)

Reviews permit process, EPA approved analytical methods, analytical methods selection, variance procedure, and other information necessary for those individuals discharging pollutants into a waterway from a point source under the Federal Water Pollution Control Act, as amended by P.L. 92-500. After public inspection and approval by the EPA Regional Administrator, a permit may be issued to an applicant, who has previously supplied required monitoring data and complied with other regulations. The procedure is called "National Pollutant Discharge Elimination System" (NPDES) and the permits are known as NPDES permits. Regulations specify the analytical methods for 71 water pollutants, which include arsenic and boron.

Anon
ARSENIC MAY BE AN ESSENTIAL NUTRIENT. . .
Chem. Eng. News 53 (16): 20 (Apr. 21, 1975)

According to the USDA Agricultural Service, arsenic seems to be an essential nutrient for rats. On a low (30 ppb) arsenic diet, pregnant rats developed rough hair, had slow growth, and enlarged spleens containing 50% more iron than control rats receiving 5 ppm of arsenic. Blood cells of their offspring broke down more readily in saline solution.

ARSENIC

See Also: 19-0044, General Information

*19-0006
ASBESTOS

Anon
TALC WORRIES RICE USERS
Chem. Week 116 (18): 24 (Apr. 30, 1975)

Fearful that talc used to coat short-grained rice may contain asbestos (a potential lung carcinogen), a Korean pathologist in New York has asked Mount Sinai Medical Center researchers to include coated rice in their studies of talc. According to the Rice Growers Association in California, the talc, which comes off when the rice is washed, contains no asbestos. Also, more than 50% of the 30.4 million lbs of medium and short-grained rice processed is not coated with talc and glucose. FDA is still seeking an accurate method for measuring traces of asbestos in talc. There are no data on the health hazards of ingested talc.

*19-0007
ASBESTOS

Anon
PROCESSING IN A CHEMICAL BATH GIVES ASBESTOS A CLEANER BILL OF HEALTH. . .
Chem. Eng. 82 (9): 47 (Apr. 28, 1975)

A processing system used since 1970 by Raysbestos-Manhattan Inc. at its textile-products plant in North Charleston, S.C., makes use of an unidentified solution of additives to hold asbestos in the solution so that particles cannot reach the workplace ambient air. In addition to providing a finished textile product with improved performance characteristics, the system reputedly provides a product with less danger to the user -- a binder keeps the asbestos locked in.

See: 19-0004, Arsenic

*19-0008
FLUOROCARBONS

Ahmed, A. Karim
UNSHIELDING THE SUN. . .HUMAN EFFECTS. GETTING THE DRIFT
Environment 17 (3): 6-14 (Apr./May 1975)

Review of the fluorocarbon/ozone controversy from a technical standpoint, covering technology's impact on ozone, ozone formation and destruction, fluorocarbons and ozone, measurement of fluorocarbon levels, use of aerosol gases, ultraviolet radiation and cancer, and other adverse biological effects. The last include a possible upset in the balance of aquatic life; a possible increase in the mutation rates of many living organisms; and potential inhibition of photosynthesis, induction of tumors, increased mutation rates, and stunted growth in plant species.

*19-0009
FLUOROCARBONS

Eigner, Joseph
UNSHIELDING THE SUN. . .ENVIRONMENTAL EFFECTS. SEEING THE SUN
Environment 17 (3): 15-18 (Apr./May 1975)

The reduction of ozone in the stratosphere and an increase of solar ultraviolet radiation may have effects more far reaching than the much-discussed possibility of an increase in human skin cancer.

Explored here are various potential effects of increased ultraviolet radiation, with reference to a study conducted by the Environmental Studies Board (ESB).

Humans may be able to protect themselves from increased radiation and live with at least a partial loss of ozone, but possible deleterious effects on plants and animals could affect the food supply necessary for life. Definite answers to this problem need research on individual species and complex ecosystems.

*19-0010
FLUOROCARBONS

Anon
SCIENTISTS DETAIL CHLOROFLUOROCARBON RESEARCH
Chem. Eng. News 53 (16): 21-3 (Apr. 21, 1975)

Discussions at recent ACS national meeting centered on controversy over ability of chlorofluorocarbons to destroy stratospheric ozone and thus result in increased UV radiation. Problems with gathering direct proof of ozone depletion, current and planned studies were discussed. Possibly, chlorofluorocarbon pollution may parallel the well-understood NO_x cycle.

One short-term solution suggested was the substitution of FC-22 (CHF_2Cl) for FC-12 (CF_2Cl_2). FC-22 contains a C-H bond and, like chlorofluorocarbons containing a C=C bond, the FC-22 can react with OH radicals in the lower atmosphere and be destroyed there; this is different from the chlorofluoromethanes.

*19-0011
FLUOROCARBONS

Cicerone, Ralph J. et al
CHLORINE COMPOUNDS AND STRATOSPHERIC OZONE
Science 188 (4186): 378-9 (Apr. 25, 1975)

Authors explain their calculations on potential large size of atmospheric effects of chlorofluoromethanes, which indicates that chemical control of the stratosphere will eventually pass to the chlorine oxides that form from use of chlorofluoromethanes. They point out the need for atmospheric measurements of background gaseous concentrations of OH, atomic oxygen, the nitrogen oxides, and the chlorine oxides, plus the need for continued monitoring of O_3. Needed also are stratospheric profiles of CF_2Cl_2, $CFCl_3$ and CCl_4.

*19-0012
FLUOROCARBONS

Gordon, Gerald A.
SMOG, OZONE, ETC. (Letter to Editor)
Environ. Sci. Technol. 9 (4): 289 (1975)

Commenting on the fluorocarbon/ozone controversy contention of possible resulting ultraviolet radiation increase and ozone depletion, the author suggests that the ozone destroyed in the stratosphere might be regenerated at some lower level in the atmosphere by the higher concentrations of oxygen then available. Thus, the net amount of UV penetrating to the Earth's surface should not undergo too great a change from normal.

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*19-0013
FLUOROCARBONS

Chesick, John P.
ATMOSPHERIC HALOCARBONS AND STRATOSPHERIC OZONE (Letter to Editor)
Nature 254 (5497): 275 (Mar. 20, 1975)

Referring to earlier atmospheric analysis data for the fluorochlorocarbons and the chlorocarbons presented by J.E. Lovelock, the author suggests that the problem might lie in the fact that fluorochlorocarbon concentrations probably will continue to grow to critical levels, rather than that the fluorocarbons might have some special stratospheric reactivity not possessed by the chlorocarbons.

*19-0014
FLUOROCARBONS

Wright, Ralph et al
CONTROLLED PROSPECTIVE STUDY OF THE EFFECT ON LIVER FUNCTION OF MULTIPLE EXPOSURES TO HALOTHANE
Lancet 1 (7911): 817-20 (Apr. 12, 1975)

This study compares the liver function in patients exposed to halothane anesthetic for a second time (or more) within a year with liver functions of controls given a halothane-free anesthetic. A significantly higher level of serum-glutamic-oxaloacetic transaminase (SGOT) was noted in the halothane-treated patients, although those having had halothane four or more times seemed to have developed a tolerance to it.

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*19-0015
FLUOROCARBONS

Trowel, Joan et al
CONTROLLED TRIAL OF REPEATED HALOTHANE ANAESTHETICS IN PATIENTS WITH CARCINOMA OF THE UTERINE CERVIX TREATED WITH RADIUM
Lancet 1 (7911): 821-4 (Apr. 12, 1975)

Of 39 patients with cervical carcinoma who were treated with radium and needed repeated anesthetics, 18 were studied when exposed to halothane, while 21 comprised a control group receiving other anesthetics. Serum-alanine-aminotransferase (SGPT) levels were measured before each general anesthetic. If the SGPT rose above 100 I.U. per liter, halothane was not used. None of the controls had high SGPT levels, but 4 of the 18 in the halothane group did before their third radium treatment. Monitoring of SGPT levels is seen as a possible means of preventing liver damage.

*19-0016
FLUOROCARBONS

Anon
HALOTHANE
Lancet 1 (7911): 841-2 (Apr. 12, 1975)

Comments on papers by R. Wright et al (See: CATS *19-0014) and J. Trowell et al (See: CATS *19-0015) relative to liver function and halothane indicate that patients with carcinoma of the liver treated with radium are peculiarly at risk when anesthetized repeatedly with halothane. Gamma irradiation of halothane causes breakdown of the drug with formation of degradation products; radium therapy may cause a similar breakdown. One degradation product of halothane is chlorohexafluorobutene, which has damaged every species in which it has been tested and which causes extensive fatty infiltration and central lobular necrosis of the liver in monkeys and rats.

*19-0017
FLUOROCARBONS

Fox, J.W.C. et al
STRATOSPHERIC OZONE DESTRUCTION AND HALOGENATED ANAESTHETICS (Letter to Editor)
Lancet 1 (7911): 864 (Apr. 12, 1975)

Potential dangers to stratospheric ozone from halogenated compounds used as aerosol propellants give rise to concern over potential of similar hazards from halogenated anesthetics. Some non-polluting alternatives include spinal and local techniques, intravenous hypnotics, analgesics.

19-0018
HALOETHERS

Anon
IS FINISHING-CARCINOGEN HUNT A NIOSH PAPER TIGER?
Text. World 125 (4): 23-4 (1975)

Alarm over potential carcinogenic hazards of some textile finishing agents may be unnecessary. Industry claims NIOSH is two years behind current technology and that finishers will not be using the questionable chemicals by the time NIOSH can determine their hazards.

Catalysts other than magnesium chloride and zinc nitrate are coming into use for formaldehyde double-press curing and resins with low free formaldehyde are being used. Use of lower free formaldehyde resins cuts the risk of formation of bis-chloromethyl ether (BCME) in the presence of chloride. Use of a chloride-free catalyst eliminates possibility of BCME formation.

BCME may be more prevalent in textiles since sampling procedures are not too accurate. NIOSH has found samples averaging about 2 ppb (ranging from 0.5 to 8 ppb) but does not know effect of BCME in these concentrations on the human body.

19-0019
HALOETHERS

Anon
BCME ALERT
Amer. Dyest. Rept. 64 (4): 10 (1975)

The American Textile Manufacturers Institute has warned member companies that the use of formaldehyde resin in the presence of chlorides (in textile finishing operations) may give rise to bis-chloromethyl ether, a carcinogen. Traces of BCME have been reported by some companies recently; substitute chemicals are now being used.

Hurwitz, Melvin D.
ASSESSING THE HAZARD FROM BCME IN FORMALDEHYDE-CONTAINING ACRYLIC EMULSIONS
Amer. Dyest. Rept. 63 (3): 62-4, 77 (1974)

The carcinogen, bis(chloromethyl) ether may be formed in nonwoven industry operations when thermosetting acrylic emulsion polymers are used as binders. The methylol acrylamide releases a finite amount of formaldehyde, when the binders are dried and cured. The formaldehyde can react with chlorides to form BCME. Thus, use of these reactants should be kept at a minimum in textile operations and working areas should be monitored for adequate ventilation. To date, no BCME has been reported from the use of thermosetting emulsion polymers in this industry.

Nilles, George P.
HCB PHOTOLYSIS (Letter to Editor)
Chem. Eng. News 53 (17): 5 (Apr. 28, 1975)

Commenting on report of E.K. Fields (See: CATS 17-0017), author agrees that hexachlorobenzene (HCB) may disappear from the oceans via solar photolysis and adds that hydrocarbon solvents may serve as excellent hydrogen donors for the photolysis of HCB between 270 and 410 nm. Photolysis of HCB in cyclohexane first yielded HCl and pentachlorophenylcyclohexane and, after an extended time yielded tetrachloro-, trichloro-, and traces of dichlorophenylcyclohexanes. A similar process in the oceans could produce lower chlorinated phenyl hydrocarbons, which could cause increasing pollution problems.

19-0022
LIQUEFACTION AND GASIFICATION OF COAL

Anon
A $3.1 MILLION RESEARCH PROJECT FOR CONVERTING COAL TO LOW-BTU FUEL GAS. . .
Chem. Eng. News 53 (17): 20 (Apr. 28, 1975)

GE and the Electric Power Research Institute will provide $3.1 million for research on the conversion of coal to low-Btu fuel gas. Work will be done at GE's Schenectady R & D center using a pilot plant fixed-bed gasifier to convert 1 ton of coal/hr to 100,000 ft. of 150 Btu/scf fuel gas. A commercial gasification plant may be ready by late 1979, early 1980

19-0023
LIQUEFACTION AND GASIFICATION OF COAL

Scotti, L.J. et al
THE PROJECT COED PILOT PLANT
Chem. Eng. Prog. 71 (4): 61-2 (1975)

In FMC's Project COED coal conversion process, coal pyrolyzed in a multiple stage, fluidized bed yields synthetic crude oil, pyrolysis gas, and a char product. Operations of a pilot plant in which more than 18,000 tons of coal have been processed through March 1974 are reviewed.

19-0024
LIQUEFACTION AND GASIFICATION OF COAL

Wintrell, R.
THE KOPPERS-TOTZEK GASIFICATION PROCESS
Chem. Eng. Prog. 71 (4): 63-5 (1975)

This brief review of raw materials treatment, description and performance of the gasifier, and solidification of the molten particulate emphasizes the reliability and versatility of the Koppers-Totzek gasification process. Claimed to be environmentally acceptable, the system can gasify fuel oil, vacuum refinery residue and refinery off-gases as well as all ranks of coal. In Japan, the K-T process simultaneously gasifies coke oven gas and coal.

19-0025
LIQUEFACTION AND GASIFICATION OF COAL

Phinney, J.A.
COAL LIQUEFACTION AT THE PILOT PLANT LEVEL
Chem. Eng. Prog. 71 (4): 65-7 (1975)

Built at Cresap, W. Va., by Consolidation Coal Co. in 1967, the 20 ton/day pilot plant described has successfully carried out the continuous solvent extraction of highly caking, Pittsburgh seam coal. Feasible now is a plant with 45 times the pilot plant output. The four steps used in converting coal into extract, char, and gas are described briefly. Catalytic hydrogenation is the key step in conversion.

19-0026
LIQUEFACTION AND GASIFICATION OF COAL

Lewis, R.
COAL GASIFICATION: SOME ENGINEERING PROBLEMS
Chem. Eng. Prog. 71 (4): 68-9 (1975)

The Bureau of Mines uses two methanation systems, in parallel, in its plant -- the Tube Wall Reactor (TWR) and the Hot Gas Recycle Methanator (HGR). Their use involves a number of engineering problems, such as selection of a proper compressor for recycling the hot gas. Another problem concerns the coal feeding lock-hopper systems. Here, high power consumption results because of losses when venting the pressurizing gases. To solve this, the Bureau uses two hoppers in the Synthane process, venting from one to the other.

19-0027
LIQUEFACTION AND GASIFICATION OF COAL

Gasior, S.J. et al
FLUIDIZED BED GASIFICATION OF VARIOUS COALS
Chem. Eng. Prog. 71 (4): 89-92 (1975)

Working with two types of coal, and studying pretreatment of a caking coal in a fluidized bed, and direct gasification of a non-caking coal in a fluidized bed, the Bureau of Mines determined that the Synthane process is feasible for production of a low Btu gas by fluidized bed gasification of either type coal with air and steam at 20 atm. pressure.

Holmgren, J.D. and Salvador, L.A.
LOW B.t.u. GAS FROM THE WESTINGHOUSE SYSTEM
Chem. Eng. Prog. 71 (4): 87-8 (1975)

Westinghouse is working to determine the feasibility of its fluidized bed coal gasification process, to scale up its gasifier, and to start up a combined cycle generating pilot plant. The advanced gasifier system should be in construction in 1977, and the test program should be completed in 1981.

19-0029
LIQUEFACTION AND GASIFICATION OF COAL

Loeding, J.W. and Patel, J.G.
THE U-GAS PROCESS
Chem. Eng. Prog. 71 (4): 85-6 (1975)

Working to overcome the problems connected with sulfur content of coal, the Institute of Gas Technology designed its U-Gas process, which eliminates pollutant emission because it removes the sulfur from the fuel gas before combustion. The sulfur is converted to easily removable hydrogen sulfide, leaving a fuel gas with as little as 10 ppm of sulfur, an acceptable emission level. The gasifier and the atmospheric-pressure ash agglomerator are described briefly.

19-0030
LIQUEFACTION AND GASIFICATION OF COAL

Lee, B.S.
SLURRY FEEDING OF COAL GASIFIERS
Chem. Eng. Prog. 71 (4): 81-4 (1975)

Discussing the IGT Hygas coal gasification process, the author considers problems with the lockhopper system, including pumps and slurry discharge from the reactor. With present technology, the wet slurry feed system appears to be more feasible than the dry lockhopper feed system for gasifiers. Overcoming problems of proper seals and cutting down on power requirements for recompressing gas could, however, help to promote the dry feed system.

19-0031
LIQUEFACTION AND GASIFICATION OF COAL

Yavorsky, P.M. et al
THE SYNTHOIL PROCESS
Chem. Eng. Prog. 71 (4): 79-80 (1975)

The Bureau of Mines Synthoil process is a one-step method of hydrodesulfurizing coal to produce a non-polluting fuel oil containing only 0.2% sulfur and 0.2% ash. Made from coal containing 5.5% sulfur, the resulting oil flows at room temperature. The unwanted sulfur is removed as hydrogen sulfide, which can be converted to saleable sulfur.

See also: 19-0034, Shale Oil Extraction and Refining

Groth, Edward III
FLUORIDE POLLUTION
Environment 17 (3): 29-38 (1975)

A review of the literature on the ecological effects of fluoride pollution shows that available data fail to provide conclusive proof that existing levels of fluoride pollution caused any major, significant, or irreversible ecological changes in the past or likely will in the future. Ecological effects, or changes in the balance of natural ecosystems, are differentiated from the rather severe damage to commercial timber crops and livestock that has occurred and that has been documented. Nevertheless, it appears almost certain that fluoride levels of higher magnitude will be found to damage the ecosystem. (86 refs.)

MODEL ECOSYSTEMS

See: *19-0009, Fluorocarbons

Lathrop, James K.
URETHANE INSULATION FIRE. ONE DEAD, SEVERAL INJURED
Fire J. 69 (3): 44-5, 95 (May 1975)

This report stresses the extreme fire hazards of sprayed-on rigid urethane foam insulation in which thick, toxic smoke was produced with extreme rapidity.

19-0034

Anon
TECHNICAL PROBLEMS FORCE REDUCTION IN GOALS FOR SYNTHETIC FUEL OUTPUT
Chem. Week 116 (17); 14 (Apr. 23, 1975)

Because of the many problems related to the conversion of coal and oil shale into oil and gas, the Ford Administration now talks about 1985 or 1990 as the on-line time for 5 or 6 third-generation synthetic fuel plants. Earlier estimates considered the possibility of 1 million bbls/day of synthetic fuels by 1985.

19-0035
VINYL CHLORIDE

Anon
GETTING VCM OFF THE PVC: TENNECO GUARANTEES 10-ppm. MAXIMUM RESIDUAL
Chem. Week 116 (18): 27 (Apr. 30, 1975)

Tenneco Chemicals claims that fabricators buying the company's vinyl chloride homopolymers, dispersion-grade and blending resins will have no trouble meeting OSHA's 0.5 ppm workplace level for vinyl chloride monomer. Tenneco guarantees that these products will have a 10 ppm maximum content of VCM. Problems with proprietary kettle cleaning and monomer evacuation methods, however, in Tenneco's new, 250-million-lbs/year PVC resin plant, Pasadena, Texas, prohibit a similar guarantee for the company's copolymers.

19-0036
VINYL CHLORIDE

Maltoni, Cesare
THE VALUE OF PREDICTIVE EXPERIMENTAL ENVIRONMENTAL CARCINOGENESES.
AN EXAMPLE: VINYL CHLORIDE
AMBIO 4 (1): 18-23 (1975)

Review of vinyl chloride carcinogenesis includes data from author's experiments on animals and information on cancers in humans attributable to this compound.

The vinyl chloride story demonstrates the need for experimental carcinogenicity testing of chemical compounds before they are released into the occupational and general environment.

Anon
CORROSION OF THE EXHAUST SYSTEM
Anti-Corrosion 22 (2): 5-6 (1975)

The exhaust system of a car is exposed to an external environment (atmosphere) and an internal environment (exhaust gases with their products of combustion). Both cause corrosion. Internal corrosion includes effects of three corrosive acids: nitric acid, sulfuric and sulfurous acids, and hydrobromic acid.

When tetraethyl lead, an anti-knock additive, is added to the fuel, lead compounds may be deposited in the combustion chamber. To fight this situation, ethylene dibromide or other additives are added to help remove lead oxide as volatile lead bromide via the exhaust. A disadvantage of ethylene dibromide is that it promotes the formation of hydrobromic acid.

19-0038
GENERAL INFORMATION

Anon
PLUTONIUM IN POWDERED OXIDE FORM....
Environment 17 (3): 21 (Apr./May 1975)

A potential health hazard addressed by Congressman Les Aspin concerns the shipping by air (from Italy to New York) of the powdered oxide form of plutonium in units of 100 lbs. An air crash in an area like New York City would be a disaster -- the very poisonous powdered plutonium would be readily dispersed and inhaled. Aspin suggests shipping the stable plutonium by sea.

19-0039
GENERAL INFORMATION

Anon
SAFE DISPOSAL OF CATIONIC COATING COLORS
TAPPI 58 (4): 15 (1975)

The potential hazards to fish from dumpings of some types of cationic coating colors were described recently in Montreal by R.H. Windhager of Merck's Chemical Division. He found that fish suffocate when cationic polymers react with their anionic gills. Neutralization and deactivation of the waste coatings by clays, synthetic polymers, pulp liquor, or anionic coatings could prevent fish kills.

Anon
A TELEGRAM. . .
Environment 17 (3): 22 (Apr/May 1975)

In the summer of 1974, some 1500 Mexican agricultural workers used hand-carried Japanese gasoline sprayers to apply DuPont's Methomyl, a toxic organophosphate pesticide, and Shell's Mevydrin to cotton plants. As a result, 689 workers were poisoned and seven of them died. The workers soaked by the pesticides had not worn protective clothing or masks. The pesticides usually are sprayed from fixed-wing aircraft.

19-0041
GENERAL INFORMATION

Spear, Robert C. et al
PESTICIDE RESIDUES AND FIELD WORKERS
Environ. Sci. Technol. 9 (4): 308-13 (1975)

"Spraying of crops with organophosphorus (OP) chemicals may be good for the plants but not so good for the pickers." A 1970 incidence of illness among California pickers in an orange grove that had been sprayed with ethyl parathion 34 days earlier and with dioxathion 4 months earlier is indicative of the problem of establishing pesticide reentry regulations on a National scale.

Factors affecting residue intoxication are presented graphically and a table lists incidence of multiple systematic illness from exposure to OP-pesticides for agricultural workers in California, 1949-1974.

Regulatory aspects, foliar residues, environmental factors, exposure mechanisms, and human exposure research are discussed.

19-0042
GENERAL INFORMATION

Anon
SOME BAD NEWS ABOUT TOXAPHENE
Science 188 (4186): 343 (Apr. 25, 1975)

Serious hazards to fish, toxicity to birds are now being claimed for the pesticide, toxaphene, use of which is relatively unrestricted legally. According to Paul M. Mehrle and F.L. Mayer, at the recent national ACS meeting, low concentrations of toxaphene stunted growth of at least three common species of fish and caused a skeletal fragility observed as broken backs. These results may be due to a vitamin C deficiency; the vitamin in the fish diet apparently is used for the detoxification of toxaphene. This pesticide is persistent but has not been linked to cancer. EPA indicates that proper application should minimize water pollution.

19-0043
GENERAL INFORMATION

Anon
LEAK CLOSES DuPONT'S TITANIUM DIOXIDE PLANT
Chem. Week 116 (18): 17 (Apr. 30, 1975)

Du Pont has closed down for an indefinite period its Edge Moor pigments plant, following a leak in its new 55,000-tons/yr chloride unit producing titanium dioxide. Although the cloud of titanium tetrachloride and chloride released caused no serious injuries, the company wants to trace the cause of the leak. The plant has a TiO_2 capacity of 110,000 tons/yr.

19-0044
GENERAL INFORMATION

Anon
CO$_2$ FROM FOSSIL FUEL ADDS TO BIOMASS
Chem. Eng. News 53 (16): 30, 32 (Apr. 21, 1975)

Only about 33% of the carbon dioxide given off by the burning of fossil fuels actually stays in the atmosphere. The rest may be dissolving in the oceans or increasing the earth's biomass. Evidence presented by Dr. F.T. Mackenzie (Northwestern Univ.) at recent national ACS meeting indicates that the missing CO$_2$ is being incorporated into plants, and estimates that a 10% increase in the biomass has occurred since use of fossil fuels started in late 1800's.

Other information presented by Dr. Mackenzie indicates that the more volatile trace elements (mercury, arsenic, selenium, antimony, and, perhaps, cadmium) have different cycles from those of such nonvolatile elements as manganese.

19-0045
GENERAL INFORMATION

Anon
URGE NICKEL PROBES
Chem. Week 116 (18): 24 (Apr. 30, 1975)

According to a recent study by the National Research Council, nickel smelters and refiners should keep health records and eliminate (or cut down) dust and fumes from the workplace. New techniques may insure less potential for cancer from the metal itself, but respiratory cancers in workers involved in making nickel oxide from nickel sulfide seem to be on the increase. Additionally, nickel has been implicated in certain skin diseases; dermatitis has resulted from the use of implanted therapeutic devices and prostheses. NRC suggests the need for research on the effects of nickel, such as its metabolic effects and its effects on the heart.

See: 19-0004, Arsenic

See: 19-0041, General Information

20-0001
ACRYLONITRILE

Winton, John M.
CW REPORT TRANSPORTATION 1975
Chem. Wk. 116 (19): 31-41 (May 7, 1975)

Review of the proposed rules (Public Law 92-500, the Muskie amendments to the Federal Water Pollution Act; the transportation Safety Act of 1974) to protect against chemical shipping hazards and the resulting problems facing the chemical industry. About 2 billion tons of hazardous materials are transported each year.

Acrylonitrile, one of 10 big-volume commodities on EPA'S first list of hazardous chemicals, was included in an Arthur D. Little, Inc. study for the Maritime Commission, which compared economic, safety and other factors for transport of chemicals by barge, rail and truck shipment. Although PL-92-500 proposes to maximize public safety and to protect the environment, one end result of the law may be the use of less-safe transport modes.

20-0002
ACRYLONITRILE

Anon
ACRYLONITRILE MAY GROW 16% ANNUALLY
Hydrocarbon Proc. 4 (4): 19 (1975)

A growth rate of 10-16% annually is predicted for acrylonitrile. Present end-use demands for this compound indicate that a world-wide demand of 11,000 million pounds can be expected by the end of 1979. A table shows world acrylonitrile capacity for 1974 through 1979.

Rocovich, Sue Ellen and West, David A.
ARSENIC TOLERANCE IN A POPULATION OF THE GRASS ANDROPOGON SCOPARIUS MICHX.
Science 118 (4185): 263-4 (Apr. 18, 1975)

Studies at Virginia Polytechnical Institute showed that plants accustomed to arsenic in the soil had developed a wide range of tolerance. Control plants failed to root in low concentrations of arsenic in soil. A genetic change wrought by selection appears to be inherent in the very tolerant species - *Andropogon Scoparius Michx.*

*20-0004
ASBESTOS

Anon
RECOMMENDED PROCEDURES FOR SAMPLING AND COUNTING ASBESTOS FIBERS
Amer. Ind. Hyg. Assoc. J. 36 (2): 83-90 (1975)

In 1974, the ACGIH established a Threshold Limit Value (TLV) for asbestos of 5 fibers greater than 5 micrometers in length per milliliter of air. Procedures for sampling and processing the collected samples are described.

*20-0005
ASBESTOS

Joint ACGIH-AIHA Aerosol Hazards Evaluation Committee
BACKGROUND DOCUMENTATION ON EVALUATION OF OCCUPATIONAL EXPOSURE TO AIRBORNE ASBESTOS
Amer. Ind. Hyg. Assoc. J. 36 (2): 91-103 (1975)

A literature review and background information provide supplemental support for the ACGIH-AIHA Aersal Hazards Evaluation Committee's recommended procedures for investigating airborne asbestos. The medical problems (e.g., asbestosis, neoplasia) associated with inhalation of asbestos fibers are reported. Sampling and analytical methods are described. The recommended membrane filter sampling optical phase microscope identification and assay technique is discussed.

*20-0006
ASBESTOS

Ortiz, Lawrence W. et al
CALIBRATION STANDARDS FOR COUNTING ASBESTOS
Amer. Ind. Hyg. Assoc. J. 36 (2): 104-12 (1975)

State agencies using fiber counting procedures for asbestos exposure evaluation are being assisted by NIOSH in standardizing test procedures. Techniques have been established for the correct preparation of calibration standards. Variations inherent in sample preparation and variations between optical counters were determined by means of these standards.

*20-0007
ASBESTOS

Curtis, Robert A. and Bierbaum, Philip J.
TECHNOLOGICAL FEASIBILITY OF THE 2 FIBERS/CC ASBESTOS STANDARD IN ASBESTOS TEXTILE FACILITIES
Amer. Ind. Hyg. Assoc. J. 36 (2): 115-25 (1975)

A technical feasibility study of two asbestos textile plants produced new considerations with regard to the textiles and OSHA's asbestos standard due to become effective July 1976. Legislation will be needed to protect producers who have funded manufacturing changes to meet regulations from those meeting only minimal compliance. A way to stimulate consumer motivation will be necessary to encourage the consumer to switch to new products when appropriate. The standard is considered to be technically feasible.

*20-0008
ASBESTOS

Fontaine, Jack H. and Trayer, David M.
ASBESTOS CONTROL IN STEAM-ELECTRIC GENERATING PLANTS
Amer. Ind. Hyg. Assoc. J. 36 (2): 126-30 (1975)

The Tennessee Valley Authority operates 12 electric generating plants in 3 states. Asbestos has been an ingredient of many insulating materials which are replaced about every six months. An asbestos control program, which has a 30-year history, now calls for the substitution of asbestos-free thermal insulation, wherever possible, to eliminate exposure.

*20-0009
ASBESTOS

Lawrence, J. et al
REMOVAL OF ASBESTOS FIBRES FROM POTABLE WATER BY COAGULATION AND FILTRATION
Water. Res. 9 (4): 397-400 (1975)

The Ontario Ministry of the Environment found-asbestos fibers in 22 samples of drinking water. Fibers can be removed from water by chemical coagulation, sand filtration, or diatomaceous earth filtration. Chemical coagulation followed by filtration removed > 99.8% of the fibers from water.

*20-0010
ASBESTOS

Plumb, R.H., Jr. and Lee, G. Fred
RESPONSE OF LAKE SUPERIOR ALGAE TO NUTRIENTS AND TACONITE TAILINGS
Water Res. 9 (4): 619-25 (1975)

A lab bioassay showed that taconite tailings were nonstimulatory and nontoxic to algae in Lake Superior. The algae did respond to tailings plus phosphate, and were stimulated by phosphate alone but not by nitrate or silica.

Although the main object of the study was to determine the algal-limiting nutrients and whether the limiting nutrient changes with time, the taconite tailings were studied because of the discharge of wastes from Reserve Mining Company into Lake Superior.

*20-0011
ASBESTOS

Anon
ASBESTOS, CHAMPLAIN, IJC REPORT SUBJECTS
Water in the News, p.4 (May-June 1975)

The International Joint Commission, which has an office at 100 Ouellette Avenue, Windsor, Ontario N9A 6T3, Canada, has issued a state-of-the-art report on asbestos. The Commission concludes that asbestos pollution will cross boundaries in Lake Superior; that scientists do not agree on hazards from ingested fibers; that methods for identifying and counting fibers need further work; and that sampling programs with regard to water will continue. An "Interim Report on the Regulation of the Richelieu River and Lake Champlain" is also available.

*20-0012
ASBESTOS

Anon
ALTERNATIVES EYED FOR TAILINGS DISPOSAL
Chem. Eng. News 53 (19): 8 (May 12, 1975)

Hearings will start on 2 June re Reserve Mining's proposal for on-land disposal of its taconite tailints. A recently-released environmental study by Arthur D. Little, Inc. for Reserve Mining found that Reserve Mining's Milepost No. 7 plan would have small impact on the physical environment, no great adverse impact on the social and economic environments, could be constructed in about three years for about $252 million. The Colvin (Milepost No.42) plan proposed by the Dept. of Natural Resources would also have small impact on the physical environment with the exception of about 86 miles of cross-country pipelines, but it might have an adverse impact on the Seven Beaver Lakes area, would be in the Superior National Forest, and would cost about $677 million. The high cost would push iron ore pellet production costs above the market value of the pellets.

*20-0013
ASBESTOS

Howard, W.P.
ASBESTOSIS (Letter to Editor)
Lancet 1 (7913): 984-5 (Apr. 26, 1975)

Responding to previous comments on the media dramatization (in England) of asbestosis, the author points out that the cited cases occurred under conditions prevailing 20, 30 or more years ago. A recent study showed that 92% of 700 personal samples were below the stringent 2 fibers/ml threshold standard established under the 1969 Asbestos Regulations. This indicates that asbestos products can be and are being used safely.

Gorski, C.H. and Stettler, L.E.
THE ADSORPTION OF WATER AND BENZENE ON AMOSITE AND CHRYSOTILE ASBESTOS
Amer. Ind. Hyg. Assoc. J. 36 (4): 292-8 (April 1975)

The surface properties of amasite and chrysotile asbestos were studied in a continuing investigation by NIOSH to determine their relationship to toxicity. Benzene was very slowly adsorbed, being unable to penetrate the smaller pores of the asbestos sample. Adsorption isotherms made with water showed that the water was physically adsorbed.

Jenkins, Richard L. and Baird, Rodger B.
THE DETERMINATION OF BENZIDINE IN WASTEWATERS
Bull. Environ. Contam. Toxicol. 13 (4): 436-42 (1975)

Benzidine is on EPA's Proposed List of Toxic Pollutants and on OSHA's list of chemical carcinogens, having been reported in several studies since 1947 as a potential carcinogen in human urinary bladders and in rodent tissues.

Results and observations noted while developing analytical procedures for the determination of benzidine in the ppm range in various wastewaters indicate that because of its sensitivity and selectivity for benzidine, the GLC analysis is preferable to the colorimetric or TLC analysis.

Corbett, T.H. et al
TERATOGENICITY OF POLYBROMINATED BIPHENYLS
Paper Presented at the 15th Ann. Mtg. of the Teratology Soc., May 11-14, 1975, Pocono Manor, Pa.

A mixture of polybrominated biphenyls (Firemaster BP-6) was used in this study. Pregnant mice were fed this substance from days 7-18 of the gestation period, at rates of 50, 100 or 1000 ppm. Animals were sacrificed at day 18. Examination showed a decrease in mean fetal weight, exencephaly evidenced at 100 and 1000 ppm, and cleft palate noted at both 50 and 1000 ppm doses.

20-0017
FLAME RETARDANTS

McHale, Edward T.
FLAME INHIBITION BY POTASSIUM COMPOUNDS
Combustion and Flame 24 (2): 277-9 (1975)

The potassium compounds, K_2SO_4, $KHCO_3$, $K_2C_2O_4$ and KBF_4, were incorporated into propellant formulations before processing to study the mechanism by which chemical inhibition occurs when certain powders are added to fuel-air flames.

The first three compounds produced strong inhibiting effects, but KBF_4 showed almost a complete lack of inhibition. Apparently, KOH, rather than the potassium metal vapor, is the species responsible for inhibition.

20-0018
FLAME RETARDANTS

Benbow, A.W. and Cullis, C.F.
THE COMBUSTION OF FLEXIBLE POLYURETHANE FOAMS:
MECHANISMS AND EVALUATION OF FLAME RETARDANCE
Combustion and Flame 24 (2): 217-30 (1975)

The effects of a wide range of halogen- and phosphorus-containing flame retardant compounds were studied to observe the chemical reactions during the "ageing" of foamed polyurethanes. Ageing improved the fire resistance of the foams containing the additives, tris(2,3-dibromopropyl)phosphate and tris(2-chloroethyl)phosphate, when they were present in more than critical concentrations. Part of the additive used is incorporated into the polyurethane structure, judging from the thermal degradation studies.

20-0019
FLAME RETARDANTS
(New Products)

Kalina, Joseph F.
THERE ARE NEW WAYS TO TAME THE FLAME. . .
Mod. Plast. 52 (5): 42-5 (1975)

A 195,000-metric ton/yr market, which may more than double by 1980, for flame retardants for plastics coupled with the push of legislation has stimulated research in flame retardance. New additives, fillers, coatings, and ready-to-use FR compounds are discussed in this review.

Among those listed: Aropahoe Chemicals DFR-121, a halogen-containing organic proposed as a smoke suppressor for flexible vinyls; American Cyanamid's phosphine oxide-ammonium polyphosphate combinations; decabromodiphenyl oxide for use in impact PS; intumescent coatings, etc.

20-0020
FLAME RETARDANTS
(New Products)

Anon
HIGH BROMINE FLAME RETARDANT
Mod. Plast. 52 (5): 26 (1975)

Dow Chemical's new FR-1540, a flame retardant for unsaturated polyester resins for use in RP boat hulls, autos, etc., is based on the company's FR-1138 (dibromoneopentyl glycol), has a high bromine content, and contains maleic, fumaric, and σ-phthalic acid links in the polymer chain. FR-1540 can be mixed with nonhalogenated resins, used with other flame retardants, or as a "topper" to chlorine derivatives.

FR-1540 is said to have good light stability, little adverse effect on nonhalogenated resins, and to be noncorrosive for stainless steel.

Anon
FLAME RETARDANCY--A PLUS FOR HIGH-PERFORMANCE RESINS
Mod. Plast. 52 (5): 22 (1975)

GE has added two new grades, N-190 and N-225, to its Noryl phenylene oxide-based flame retarding resins. Table lists typical properties of Noryl injection molding resins.

FLAME RETARDANTS

See: 20-0016, Brominated Biphenyls

*20-0022
FLUOROCARBONS

Leonard, Paul F.
THE LOWER LIMITS OF FLAMMABILITY OF HALOTHANE, ENFLURANE, AND ISOFLURANE
Anesthesia and Analgesia 54 (2): 238-40 (Mar.-Apr. 1975)

It is inadvisable to use electrosurgery if nitrous oxide is part of the anesthetic mixture. Tests were conducted with the anesthetics, halothane, enflurane or isoflurane. The combination of nitrous oxide-oxygen atmosphere with halothane is combustible in concentrations found in clinical anesthesia.

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*20-0023
FLUOROCARBONS
(Uses)

Dukert, Andrew A.
USE OF POLYVINYLIDENE FLUORIDE TO FIGHT CORROSION
TAPPI 58 (4): 152-4 (1975)

Polyvinylidene fluoride has established itself as an extremely chemical resistant material which has become standard in the pulp and paper industry for use as pipe, pumps, vessel linings, and as a coating for equipment that must withstand highly corrosive environments at reasonably high temperatures. Since this material can be made into monofilaments, new uses such as washer filters, screens, demisters, etc. have been introduced.

*20-0024
FLUOROCARBONS

Anon
THE SOUTH POLAR CONTINENT. . .
Chem. Eng. News 53 (18): 22 (May 5, 1975)

Air pollution researchers at Washington State University feel that the south polar ice may be freezing out trace gases as the global circulations bring air in contact with the ice. Dr. Reinhold A. Rasmussen says that ramarkably high concentrations of chlorinated hydrocarbons and chlorofluorocarbons, such as Freon II, were found in the surface snow at the new Scott-Amundsen polar station.

*20-0025
FLUOROCARBONS

Holmes, Steven A. and Thomas, T. Darrah
ELECTRON DISTRIBUTION IN TRIFLUOROMETHYLBENZENES.
ELECTRON DONATION BY THE TRIFLUOROMETHYL GROUP
J. Amer. Chem. Soc. 97 (9): 2337-41 (Apr. 30, 1975)

In this continuing study of the charge distributions within the molecules of trifluoromethylbenzenes, including 1,3-di(trifluoromethyl)benzene and 1,4-di (trifluoromethyl)benzene, it was determined that the chemical properties of these molecules correlate well with the core binding energy shifts, which are a measure of the ionization potential at a given atom.

*26-0026
FLUOROCARBONS
(Uses)

Walters, A.R. and Hurgeton, J.C.
HEPA FILTER. LEAK TESTING USING FREON TF AEROSOL
Contam. Contr./Biomed. Environ. 11 (5 & 6): 20-1 (May/June 1975)

To measure the effectiveness of high-efficiency particulate air (HEPA) filters, the Army Chem. Corps developed a test method using dioctylphthalate (DOP), which, although satisfactory as a technique, had certain disadvantages.

By accident, Freon TF was discovered to be an alternate, and tests showed that by using the Freon a fast, inexpensive leak test, equal in accuracy to the DOP method, was possible.

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*20-0027
FLUOROCARBONS

Cox, R.A. et al
LONG-RANGE TRANSPORT OF PHOTOCHEMICAL OZONE IN NORTH-WESTERN EUROPE
Nature 255 (5504): 118-21 (May 8, 1975)

Photochemical ozone and the pollutants from which it is formed were studied with the aid of meteorological stations in England and Ireland. A significant portion of the ground level ozone in southern Engalnd for summer 1973 was found to be produced by man. Under suitable meteorological conditions photochemical ozone can be transported many miles so that even isolated areas can be affected. There is evidence that pollutants and the ozone layer over Britain could have originated in north-west Europe.

Dixon, Dale D. and Holland, Dewey G.
FLUOROCARBONS: PROPERTIES AND SYNTHESES
Fed. Proc. 34 (6): 1444-8 (May 1975)

Custom syntheses of fluorocarbons for use as artificial blood substitutes are discussed with attention directed to the electrochemical fluorination of hydrocarbons. The physical properties of fluorocarbons are reviewed briefly and the acute inhalation toxicity of several fluoroethanes is given.

20-0029
HALOETHERS

Johncock, Peter and Hewins, Maurice A.H.
POLYFLUOROETHERS FROM 2,2,3,3,4,4-HEXAFLUOROPENTANEDIOL AND BIS(CHLOROMETHYL) ETHER AND BISHALOMETHYL-SUBSTITUTED AROMATIC COMPOUNDS
J. Polym. Sci. (Polym. Chem. Ed.) 13 (4): 807-14 (1975)

Looking for improved elastomeric materials for use in aircraft, the authors synthesized some polyfluoroethers from 2,2,3,3,4,4-hexafluoropentanediol (HFPD) and bischloromethyl ether and bishalomethyl-substituted aromatics using the Williamson reaction. The various preparations and some of their properties are described.

20-0030
HALOETHERS

Evans, Kenneth P. et al
DETECTION AND ESTIMATION OF BIS(CHLOROMETHYL)ETHER IN AIR BY GAS CHROMATOGRAPHY-HIGH RESOLUTION MASS SPECTROMETRY
Anal. Chem. 47 (6): 821-4 (May 1975)

Identification and quantitative determination of bis(chloromethyl)ether (BCME) in the atmosphere of work areas in manufacturing plants and laboratories can be provided by an analytical method which combines gas chromatography and high resolution mass spectroscopy and is able to detect 0.1 ppb v/v BCME on a one liter air sample. Interest in the detection of BCME, a potential carcinogen, has been further stimulated by the report that it forms spontaneously from formaldehyde in the presence of HCℓ.

20-0031
HALOETHERS

Solomon, Richard A. and Kallos, George J.
DETERMINATION OF CHLOROMETHYL METHYL ETHER AND BIS-CHLOROMETHYL ETHER IN AIR AT THE PART PER BILLION LEVEL BY GAS-LIQUID CHROMATOGRAPHY
Anal. Chem. 47 (6): 955-7 (May 1975)

Gas chromatographic-mass spectrometric procedures meet the specificity and sensitivity requirements for measuring airborne concentrations of CMME and bis-CMME but need sophisticated instrumentation that does not lend itself conveniently to on-site plant analysis. Therefore, several gas chromatographic approaches were tried to find a method sensitive enough to detect these compounds at the ppb level. These are described.

20-0032
HALOETHERS

Anon
ROHM AND HAAS MOVES TO CLEAN UP PLANT EFFLUENT
Chem. Wk. 116 (19): 23 (May 7, 1975)

Following the discovery of traces of bis(2-chloroethyl) ether in the effluent discharged into Philadelphia's sewer system, Rohm and Haas discontinued using the chemical at its plant nearby. The company's discharges, up to 135 lbs/day, have evidently contributed to the 10 ppb of chloroethyl ether recently found in the city's Northeast treatment plant discharges. Rohm & Haas has modified its process to eliminate the intermediate, which is used in industrial surfactant production, from the plant effluent. Levels of 0.4-0.5 ppb of chloroethyl ether were discovered at Philadelphia's Delaware River intake.

See: *20-0022, Fluorocarbons

20-0033
HEXACHLOROBENZENE

Villeneuve, David C.
THE EFFECT OF FOOD RESTRICTION ON THE REDISTRIBUTION OF HEXACHLOROBENZENE IN THE RAT
Toxicol. Appl. Pharmacol. 31: 313-9 (1975)

This study was conducted to determine the extent to which hexachlorobenzene (HCB) is redistributed when fat depots in animals with previous HCB exposure are mobilized. Only animals subjected to food restriction and given doses of 100 mg/kg for 14 consecutive days showed signs of toxicity, while those dosed at other levels showed no toxic signs with the exception of an increased liver/body weight ratio at 10 mg/kg. All deaths, which occurred, did so after the 14-day period; prior to death animals exhibited a loss of appetite, tremors, and a red nasal discharge. The residue profile shows HCB accumulation in all tissues in relation to dose. Brain residue levels exceeded 300 ppm in all animals that died or exhibited toxic symptoms.

Because humans restrict their diets for various reasons, tissue redistribution of pesticide burdens can be a potential health hazard.

20-0034
HEXACHLOROBENZENE

Villeneuve, D.C. and Hierlihy, S.L.
PLACENTAL TRANSFER OF HEXACHLOROBENZENE IN THE RAT
Bull. Environ. Contam. Toxicol. 13 (4): 489-91 (1975)

Hexachlorobenzene (HCB), judged an environmental contaminant via its use as a fungicide and as an industrial chemical, was studied to determine its accumulation by the rat fetus *in utero*. The data indicate that HCB crosses the placenta and accumulates in the fetus in a dose-dependent manner but, as in earlier studies, no fetopathic effects were observed at any dose level.

20-0035
ISOCYANATES

Porter, Charles V. et al
A RETROSPECTIVE STUDY OF CLINICAL, PHYSIOLOGIC AND IMMUNOLOGIC CHANGES IN WORKERS EXPOSED TO TOLUENE DIISOCYANATE
Amer. Ind. Hyg. Assoc. J. 36 (3): 159-68 (1975)

Hypersensitivity to toluene diisocyanate (TDI) appeared to have a direct relationship to frequency of significant exposure (greater than 0.05 ppm) and the air concentration of TDI vapors inhaled. Hypersensitive workers removed from exposure eliminated their clinical problems. This retrospective study of 32 case histories of workers in a TDI plant, which has been in continuous operation since 1956, was based on physical examination, pulmonary function measurements, and immunologic tests. One group of seven demonstrated tolerance by a negative response to immunologic tests. In another group of seven, bronchoconstriction was experienced with TDI exposure even though these workers were found to have protective antibodies.

20-0036
ISOCYANATES

Nielson, Arthur and Booth, K.S.
A TECHNIQUE FOR DYNAMIC CALIBRATION OF A CONTINUOUS TOLUENE DIISOCYANATE MONITOR
Amer. Ind. Hyg. Assoc. J. 36 (3): 169-71 (1975)

The analytical methods developed for the dynamic calibration of continuous TDI monitors are described. Instruments were calibrated against the Marcali method and substantial agreement was noted in determining micro-amounts of TDI in the atmosphere.

ISOCYANATES

See: 20-0050, Polyurethanes
     20-0051, Polyurethanes

20-0037
LIQUEFACTION AND GASIFICATION OF COAL

Anon
WILL COAL GASIFICATION HURT ENVIRONMENT?
Hydrocarbon Proc. 4 (4): 17-8 (1975)

Battelle Columbus Laboratories under contract to EPA studied the environmental impact of coal gasification and concluded that it would be necessary to dispose of the ash residue, control coal dust, and remove such potential atmospheric emissions as sulfur and particulates from the fuel gas. Generation of additional liquid and solid waste might follow.

For the needed energy, a large gasification system might have to be installed and operated. Four categories of industry (chemicals and allied products; primary metal industries; petroleum refining and related industries; and stone, clay, glass and concrete products) were analyzed re conversion to low-energy gas. Among most promising: chemical feedstock heating, sintering, open-hearth furnaces, reverbatory furnaces, heat treating and kiln firing.

20-0038
LIQUEFACTION AND GASIFICATION OF COAL

Anon
ERDA HEAD RESISTS FORD'S PLAN. . .
Coal Age 80 (4): 9 (1975)

President Ford's proposed substitute fuel industry based on 20 plants producing the energy equivalent of 1 million bbl of oil a day by 1985 is not realistic, according to ERDA's Director, Robert C. Seamans. Seamans estimates that 30 fuel plants at a cost of $1 billion each would be needed. Some plants will convert coal to oil, others will produce high-grade or low grade gas. Seamans estimates a minimum of ten years to go from pilot plant to commercial-size plants, assuming no delays, but expresses doubts about the economic feasibility of the program.

20-0039
LIQUEFACTION AND GASIFICATION OF COAL

Anon
OVERSEAS TECHNOLOGY AIDS GASIFICATION HERE
Coal Age 80 (4): 25 (1975)

Coal gasification technology developed in Britain and Russia will be available soon to U.S. according to 1) announcement that Applied Technology Corp., Pittsburgh, has reached agreement with Wellman Incandescent, Ltd. for exclusive rights to its coal gasification technology for producing clean, uninterruptable fuel gas, and 2) Texas Utilities Services Co's contract with Licensintorg of Moscow for Russian process to gasify deep lignite coal deposits in eastern Texas.

20-0040
LIQUEFACTION AND GASIFICATION OF COAL

Reychok, Milton R.
PERSPECTIVE ON COAL CONVERSION (Letter to Editor)
Environ. Sci. Technol. 9 (5): 396-7 (1975)

Commenting on Rubin McMichael's article (See: CATS 14-0019), the author compares EPA'S NSPS of 1.2 lbs $SO_2/10^6$ Btu with New Mexico's standard of 0.34 lbs, and stresses that a single national standard cannot be equitably applied.

He refutes Rubin and McMicahel's reference to gaseous emissions of cyanides, ammonia and hydrogen chloride from coal gasification by pointing out that, in the Lurgi gasification process, the process gas is Rectisol-treated to remove H_2S and CO_2; the H_2S is converted to by-product sulfur; the gas is refrigerated to -40°F at 300 psig, and the end result is removal of all cyanides, ammonia and other gaseous contaminants in aqueous liquors. These liquors are bio-treated so that in essence there should be no emissions of gaseous cyanides, ammonia or hydrogen chloride to the atmosphere.

20-0041
4,4'-METHYLENEBIS (2-CHLOROANILINE)
(MOCA)

Schmitt, C.R. and Cagle, G.W.
SULFAMIC ACID CLEANING SOLUTION FOR 4,4'-METHYLENE-BIS-ORTHOCHLOROANILINE (MOCA)
Amer. Ind. Hyg. Assoc. J. 36 (3): 181-6 (1975)

In plant operating areas where electrical machinery and other spark or ignition hazards exist, an aqueous solution of 1.0 wt% sulfamic acid-0.5 vol% surfactant was demonstrated as a non-flammable solubilizing and cleaning agent for 4,4'-methylene-bis-orthochloroaniline (MOCA)-contaminated surfaces. The MOCA is decontaminated to less than the analytical detectable limits (10 µg/25 sq in). A salt compound is formed when sulfamic acid reacts with MOCA and the nuclear magnetic resonance (NMR) spectrum changes. This shift in the MOCA spectrum indicates chemical and possibly carcinogenic and toxicological property changes.

4,4'-METHYLENEBIS(2-CHLOROANILINE)
(MOCA)

See: 20-0050, Polyurethanes

20-0042
MODEL ECOSYSTEMS

Jensen, Roy A. and Pierson, Duane L.
EVOLUTIONARY IMPLICATIONS OF DIFFERENT TYPES OF MICROBIAL ENZYMOLOGY FOR L-TYROSINE BIOSYNTHESIS
Nature 254 (5502): 667-71 (Apr. 24, 1975)

Several enzyme arrangements for L-tyrosine biosynthesis in modern microorganisms differ in pattern of regulatory control. A less refined regulation exists in blue-green bacteria (algae), which have a somewhat primitive pathway, than that of *Escherichia coli*, which has a 4-hydroxyphenylpyruvate pathway. There is, perhaps, an overall scheme of pathway evolution with modern organisms having pathways indicative of different stages of an apparent evolutionary sequence. The authors suggest that substantial variation in the selective pressure for regulation of L-tyrosine biosynthesis exists within the different ecological niches of specific organisms. The evolutionary stage of pathway development may reflect the degree of selective pressure for regulation.

20-0043
MODEL ECOSYSTEMS

Craig, Robert B. and Rudd, Robert L.
THE ECOSYSTEM APPROACH TO TOXIC CHEMICALS IN THE BIOSPHERE
pp. 1-24 in Survival in Toxic Environments. Proc. of a Symposium organized by American Soc. of Zoologists Houston, Tex., Dec. 28-30, 1973, edited by M.A.Q. Khan and John P. Bederka, Jr. Academic Press, NYC. 1974. 553pp. $19.50

A modular means of presentation is offered to regulatory and political agencies having to make decisions resulting from the intrusion of synthetic chemicals into ecological systems. Aquatic systems are treated; computer analyses of the DDT-R "load" throughout the lacustrine ecosystem and descriptive and predictive models of the pesticide residue values in fishes and one fish-eating bird are given. The ecokinetic analysis of chemical residues are extended to a simplified terrestrial ecosystem. Transferability of the models to all persistent chemicals from any source in living systems is noted.

Anon
COASTAL ECOSYSTEMS
Environ. Rept. 5 (24): 194 (Apr. 30, 1974)

"Coastal Ecosystems," a 178-page guidebook on coastal ecology, offers professionals and laymen useful background information for coastal ecosystem management. Available from Conservation Foundation, 1717 Massachusetts Avenue, N.W., Washington, D.C. 20036, for $4.

20-0045
MODEL ECOSYSTEMS

Hall, Charles A.S. et al
A FIFTEEN-YEAR RECORD OF BIOTIC METABOLISM IN THE NORTHERN HEMISPHERE
Nature 255 (5504): 136-8 (May 8, 1975)

Biotic metabolism of Northern Hemisphere reflects no changes in basic pattern from 1959 to 1972. Possibly, the biosphere is too big to be affected by industrial processes or the stimulatory effects of atmospheric CO_2 enrichment counteract the potentially adverse effects of acid rain, atmospheric dust loading, etc.

Warren, Craig B.
BIODEGRADATION OF NITRILOTRIACETIC ACID AND NTA-METAL ION COMPLEXES:
pp.473-96 in Survival in Toxic Environments. Proc. of a Symposium
organized by the Am. Soc. of Zoologists, Houston, Tex., Dec. 28-30, 1973,
edited by M.A.Q. Khan and John P. Bederka, Jr. Academic Press, NYC. 1974
553 pp. $19.50

This review (with 50 references) proposes to provide answers to questions on the pathway of NTA biodegradation, kinetics and mechanism of NTA biodegradation, biodegradability of NTA metal complexes, and the tolerance range of NTA biodegradation.

20-0047
PERCHLOROETHYLENE

Brodman, George L.
RETENTION OF CHLORINATED SOLVENTS IN FABRICS
Textile Chem. Color. 7 (5): 20/80-22/82 (1975)

The affinity of various textile fabrics for the three chlorinated solvents (perchloroethylene, trichloroethylene, and 1,1,1-trichloroethane) is discussed. If time, temperature, solvent treatment and drying conditions are properly selected, the fabrics tested in this study (including acetate, polyester, polypropylene, wool, nylons, etc.) can be processed without retaining significant amounts of solvent. Selected physical properties of perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, and water are tabulated.

20-0048
PERCHLOROETHYLENE

Saxton, James C. and Narkus-Kramer, Marc
EPA FINDINGS ON SOLID WASTES FROM INDUSTRIAL CHEMICALS
Chem. Eng. 82 (4): 107-12 (Apr. 28, 1975)

This study of 33 chemicals (including perchloroethylene) covers process-related solid wastes unique to the chemical industry and associated liquid/solid slurries and sludges. Industry anticipates a solid-waste reduction of 13.6% by 1977. Item describes the wastes and treatment and disposal methods; includes current and future chemical production figures as well as current and future waste production figures.

Jones, Adelaide E. et al
PHTHALATE ESTER TOXICITY IN HUMAN CELL CULTURES
Toxicol. Appl. Pharmacol. 31: 283-9 (1975)

The toxic effect of phthalate esters on human cells is examined, using di-2-ethylhexyl phthalate (DEHP) and butyl glycolyl butyl phthalate (BGBP) plasticizers. Effects on cell protein were less in a nonreplicating, confluent cell layer than in replicating cell populations. DEHP and BGBP, several other phthalate esters, and two nonphthalide compounds can be leached into blood from certain polyvinyl chloride plastic medical devices. Experimental evidence of "subtle toxicity" from the phthalate esters in PVC-containing plastics and the possibility of tissue accumulation of DEHP are indications of potential clinical problems.

PHTHALATES

See: *20-0026, Fluorocarbons

20-0050
POLYURETHANES

Singh, Ajaib and Saxon, Robert
MOISTURE-RESISTANT URETHANES
Rubber Age 107 (4): 53-7 (1975)

Polyester-based urethane prepolymers, which are TDI-terminated aliphatic polyesters, with molecular weights in the 700 to 2,200 range, cured with MOCA, have been developed. These stabilized prepolymers, now available commercially, demonstrate resistance to moist atmosphere aging similar to that of polyether-based urethanes. They also possess high initial tensile strength and thermal stability, and cost no more than the polyether type.

20-0051
POLYURETHANES

Pearson, C.J. et al
DYNAMIC PROPERTIES OF CAST URETHANE ELASTOMERS
Paper Presented at ACS Rubber Div. 107th Mtg., Cleveland, Ohio, May 6-9, 1975

Dynamic properties of polyurethanes and polyureaurethanes are compared on the basis of flexometer and resilometer tests, showing the effect of polymer ingredients, aging and casting size. The polyether- and polyester-based urethanes tested were made with various diisocyanates and cured with glycols or diamines.

[Abstract in: Rubber Age 107 (4): 33 (1975)]

Dieter, Jerry A. et al
LIGHT-STABLE POLYURETHANES FROM ADIPODINITRILE CARBONATE
J. Paint Technol. 47 (603): 65-70 (Apr. 1975)

A new chemical compound, adiponitrile carbonate (ADNC), reacts with hydroxyl groups to form urethanes, and with amino groups to yield ureas. More precisely identified as 5,5'-tetramethylene di-(1,3,4-dioxazol-2-one), ADNC yields light-stable polyurethanes, thus making it attractive for coatings. Some such coatings have been prepared and their physical properties are described here. ADNC is also a useful crosslinking agent for hydroxyl-containing acrylic resins.

POLYURETHANES

See: 20-0018, Flame Retardants

Anon
TRICHLOROETHYLENE IS POSSIBLE CARCINOGEN
Chem. Eng. News 53 (18): 6 (May 5, 1975)

The National Cancer Institute has issued a "memorandum of alert", based on preliminary data, warning producers, users, and regulatory agencies that trichloroethylene is a potential carcinogen. NCI tests indicate that the compound induces tumors in mice, predominantly liver cancer.

PPG questions the use of very high dose levels by NCI and the feeding of trichloroethylene to the mice, since inhalation is the major exposure hazard. NCI's Dr. N. Page claims, however, the method of administration would not affect results because trichloroethylene is readily absorbed in the lungs and enters the bloodstream rapidly.

U.S. production of trichloroethylene was 434 million lb. in 1974, of which 95% may have been used for vapor degreasing of metal parts.

TRICHLOROETHYLENE

See: 20-0047, Perchloroethylene

Anon
ELSEWHERE, THE FIRST MAJOR TEST OF FUELS
Chem. Eng. 82 (10): 38 (May 12, 1975)

Three jet fuels, two diesel fuels, leadfree gasoline and heavy fuel oil derived from crude oil produced by the Paraho Development Corp. shale project are being tested in government and industry vehicles. The approximately 6,000 bbl of fuels plus the equivalent of about 2,100 bbl of high-grade coke, and the equivalent of 500 bbl of pyrolysis gas were refined from about 10,000 bbl of crude shale oil. About 1,100 bbls were used in operating the refinery.

20-0055
VINYL CHLORIDE

Anderson, Earl V.
RECESSION STIFLES OUTPUT OF TOP 50 CHEMICALS
Chem. Eng. News 53 (18): 30-3 (May 5, 1975)

Vinyl chloride is among the top 50 chemicals discussed in this review, which shows a growth rate of only 1.3% in 1974 for the top 50 chemicals.

20-0056
VINYL CHLORIDE

Freund, Samuel M. and Sweger, Daniel M.
VINYL CHLORIDE DETECTION USING CARBON MONOXIDE AND CARBON DIOXIDE INFRARED LASERS
Anal. Chem. 47 (6): 930-2 (May 1975)

The sensitive, selective detection procedure based on Stark modulation absorption of infrared laser radiation described here should be feasible for quantitative determinations of vinyl chloride in the presence of other molecules.

20-0057
VINYL CHLORIDE

Anon
PVC PLANTS ARE READY TO PASS FIRST TEST
Chem. Wk. 116 (19): 49-50 (May 7, 1975)

Vinyl chloride monomer plants are readying for OSHA inspection under the current standard limiting VCM to 25 ppm, but should readily pass inspection. Sterner tests are yet to come, if the 1-ppm exposure limit actually becomes the standard in April 1976.

In June 1975, EPA may propose standards limiting VCM emissions to the atmosphere may set a 400 ppm limit.

Various manufacturers comment briefly on meeting the OSHA standard with or without respirators, on efforts to improve process techniques, on new plant capacities, on the use of large reaction vessels, on cleanup, etc.

20-0058
VINYL CHLORIDE

Anon
DOWN WITH MONOMER IN PVC FOR PACKAGING
Mod. Plast. 52 (5): 49 (1975)

Four new commercial compounds from Pantasote, Ethyl Corp., Robintech, and Hooker are evidence that PVC bottle, film and sheet compounds that have 1 ppm or less of residual VCM will be available for packages.

Food-grade PVC is not yet required to contain zero monomer and FDA is not rushing into action following recent disclosures by C. Maltoni of carcinogenicity among lab animals from VCM, which was fed to the animals in high doses. Maltoni is now conducting additional studies using much lower doses.

Daniels, G.A. and Proctor, D.E.
VCM EXTRACTION FROM PVC BOTTLES
Mod. Packag. 48 (4): 45-8 (1975)

A model is presented for the relationship between VCM in PVC bottles and the maximum concentration in the contents. Tests show that this maximum can be held below the 50-ppb level.

20-0060
GENERAL INFORMATION

Anon
RADIOLUMINOUS MATERIALS
Environ. Rept. 5 (24): 191 (Apr. 30, 1975)

Until ways are found to protect workers from overexposure, radium should not be used to paint dials of watches and clocks, nor should promethium-147 be used in place of radium. One safer compound for this purpose is tritium. This, in summary, is the conclusion given in "Public Health Implications of Radioluminous Materials," by A.A. Moghissi and M.W. Carter, Office of Interdisciplinary Programs, Georgia Inst, Tech.

The U.S. Bur. Radiological Health reports only approximately 200,000 radium-226 activated clocks and an insignigicant number of wrist watches distributed in the U.S. in 1973, but 900,000 promethium-activated wrist watches and 1,370,000 clocks, mostly imported, were distributed. U.S.-made and imported watches and clocks with tritium dials were in the order of 5.4 million and 260,000, respectively.

Radiation exposure from radium and tritium is high; the quantity from promethium is unknown.

20-0061
GENERAL INFORMATION

Anon
A NONSEPARATING MIXTURE OF GASOLINE AND WATER. . .
Chem. Eng. News 53 (18): 22 (May 5, 1975)

A substitute for leaded gasoline has been prepared which uses 10% water mixed with the gasoline. A proprietary bonding agent called Hydrelate keeps the mixture from separating. The developers, United International Research, Inc., claim that hydrocarbons and lead emissions are substantially reduced.

20-0062
GENERAL INFORMATION

Anon
PESTICIDES IN CARPET
Environ. Rept. 5 (24): 192 (Apr. 30, 1975)

Research workers at the University of Iowa, analyzing sections (one inch squares) of wool and synthetic carpet taken from homes and retail stores, found that at least one chlorinated pesticide was present in all samples examined. Most carpets are treated at the mill with pesticides to prevent insect damage, the researchers noted.

20-0063
GENERAL INFORMATION

Anon
CANCER AND CHEMICALS: RISKS MAPPED
Sci. News 107 (18): 286-7 (May 3, 1975)

National Cancer Institute study of cancer mortality rates by geographic areas in U.S. exhibited in 34 maps. Among findings: strong correlations between lung- and liver-cancer levels around concentrations of chemical industries; high lung-cancer rates near copper and lead smelters; and high bladder-cancer levels around heavy auto production areas.

20-0064
GENERAL INFORMATION

Anon
NIOSH HAS IDENTIFIED 1500 CHEMICALS AS POSSIBLE TUMORIGENS. . .
Chem. Eng. News 53 (19): 9 (May 12, 1975)

A list of 1500 chemicals, which are possible tumorigens, is available from NIOSH. The specific chemicals were identified from primary literature sources. The list will soon be published in the Federal Register.

20-0065
GENERAL INFORMATION

Anon
HOW HOT IS OCEAN INCINERATION?
Environ. Sci. Technol. 9 (5): 412-3 (1975)

Ocean incineration seems to be a feasible way to dispose of chlorinated hydrocarbon wastes, but final evaluation depends on additional tests, some of which are underway via EPA. This disposal idea originated in Germany. Some problems include sodium concentration, increasing viscosity, longer burning time for wastes containing high percentage of water.

Some positive notes were sounded in a Jan. 1974 report from the Center of Biological Studies and Research and of Oceanographic Medicine, Nice, France, which states that incineration at sea apparently does not bring about changes in the biomass; and does not cause accumulation through the nutrition chain, etc.

Anon
AQUATIC LIFE/CHEMICALS
Environ. Rept. 6 (1): 8 (May 12, 1975)

Literature published during the period 1968-1972 was the source for a compilation of data concerned with the effects of chemicals on aquatic life. The publication, available without charge from the Office of Research and Development, Environmental Protection Agency, Washington, D.C. 20460, is titled: "Water Quality Criteria Data Book, Volume 5: Effects of Chemicals on Aquatic Life," EPA-18050 HLA09/73.

21-0001
ARSENIC

Anon
MONITORING EXPOSURE TO ARSENICALS
Food Cosmet. Toxicol. 13 (2): 285 (Apr. 1975)

Reference is made to an editorial in "British Medical Journal" 3, 487 (1974), which comments on the still high use of arsenical compounds as herbicides and insecticides. In Britain, the control of weeds and seedling trees in forests involves the use of simple arsenical mixtures against which the wearing of goggles and gloves provides satisfactory worker protection. In the U.S., however, workers are exposed to more toxic preparations, including dimethylarsinic acid, and protective clothing notwithstanding, they apparently absorb organic arsenic, some of which they excrete in the urine. Reference is made to a study by Wagner and Weswig, "Arch. Environ. Health" 28, 77 (1974), in which they showed that arsenic could be recovered from the urine during the first week of exposure, that the urinary content of arsenic rapidly declines after exposure stops, but there is still the question of whether all arsenic absorbed is eventually eliminated. Because dimethylarsinic acid may be converted to arsine by fungi, there is a potential inhalation hazard for forestry workers.

21-0002
ARSENIC

Kniep, Theodore J.
POTENTIAL APPLICATIONS OF X-RAY ANALYTICAL METHOD IN PAINT ANALYSIS
J. Paint Technol. 47 (604): 71-6 (May 1975)

Multi-element trace analyses of paint samples are considered with special attention to the X-ray analytical method. This method offers sensitivity, speed, reliability, and ease of sample preparation. Of those discussed, systems employing X-ray fluorescence and semi-conductor detectors are most useful. The paint industry's concern derives from the potential danger to humans who might be exposed to toxic elements if they inadvertently ingest dried paint solids.

*21-0003
ARYL PHOSPHATES

Anon
FMC STARTS UP EXPANSION OF PHOSPHATE ESTERS
Chem. Wk. 116 (22): 14 (May 28, 1975)

Kronitex fire retardant plasticizers for polyvinyl chloride are principal products of FMC Corporation's phosphate ester plant at Nitro, W. Virginia, which has just undergone a $10 million expansion. Plant capacity is up to 65 lbs/year from 30 million lbs/year; commercial Kronitex 100 triaryl phosphate is a substitute for tricresyl phosphate.

*21-0004
ARYL PHOSPHATES

Boyer, Kenneth W. and Laitinen, Herbert A.
AUTOMOBILE EXHAUST PARTICULATES. PROPERTIES OF ENVIRONMENTAL SIGNIFICANCE
Environ. Sci. Technol. 9 (5): 457-69 (1975)

Automobile exhaust particulates were collected and analyzed by gas chromatography-mass spectroscopy revealing the presence of hundreds of compounds (about 50% saturated aliphatic, 5% polynuclear aromatic, and 30% oxygenated hydrocarbons.) Among compounds identified were triphenyl phosphate and the mono-, di-, and trimethylsubstituted triphenyl phosphates. Catalytic converters effectively reduced total particulate emissions and more effectively reduced the ether-extractable organic content of filter particulates. UV irradiation caused photochemical degradation, which was greater in leaded than in nonleaded particulates.

Reist, Parker C.
COUNTING ASBESTOS FIBERS BY THE MOST PROBABLE NUMBER METHOD
Amer. Ind. Hyg. Assoc. J. 36 (5): 379-84 (1975)

The most probable number method (of bacteria counting) is considered promising for evaluating asbestos fiber counts. The advantages offered by this method include shorter sampling time, shorter counting time, less chance of overlap, and less eyestrain for the microscopist. A disadvantage is that fibers must be estimated to within an order of magnitude before counting. Accuracy compares well with conventional counting methods, however.

Anon
FIRE-PROOFING AGENTS ARE FOR ALL FIBERS
Textile World 125 (5): 111 (1975)

Flame-proofing agents were prepared from propargyl alcohol, treated with phosphoric acid to form the triphosphate, and halogenated with bromine, chlorine or both. Tri (2:3-dibromoallyl) phosphate, tri (2,2,3,3-tetrachloropropyl) phosphate, and tri (2,2,3-tribromo-3 chloropropyl) phosphate are examples of these agents which impart self-extinguishing properties to both natural and synthetic fibers. GAF holds British Patent 1,376,979 on the products.

FLAME RETARDANTS

See: *21-0003, Aryl Phosphates

*21-0007
FLUOROCARBONS

Anon
FLUOROCARBON AEROSOL PROPELLANTS
Lancet 1 (7915): 1073-4 (May 10, 1975)

Non-inflammability, low degree of toxicity and other advertised properties of fluorocarbons led to their wide use in industrial and medical applications. Not until "sniffing"deaths were reported in 1970 in the U.S., and questions were then raised about an epidemic of asthma deaths in Britain and other countries from 1960 to 1967 was much thought given to the potential hazard of aerosol propellants. A recent report now indicates that the use by surgical-pathology residents of an aerosol preparation containing monochlorodifluoromethane to accelerate precipitation of frozen sections produced palpitations higher than in those not exposed.

Brief review is given of animal studies made to assess toxicity of fluorocarbons. Animals exposed to concentrations of 20% dichlorodifluoromethane (fluorocarbon-12) and dichlorotetrafluoroethane (fluorocarbon-114) became sluggish, drowsy, and developed tremors; and some died from the fluorocarbon-114. Other studies showed that monkeys and dogs developed ventricular arrhythmias from different concentrations of fluorocarbon-11 and fluorocarbon-114. It appears, however, that while deliberate inhalation of very high concentrations of fluorocarbons (as in glue sniffing, or by asthma patients) is dangerous, there is little or no danger from the use of pressurized aerosol cans in the recommended manner. Nevertheless, studies to develop safer methods of dispensing inhaled drugs are recommended.

*21-0008
FLUOROCARBONS

Mercer, T.T.
AEROSOL TECHNOLOGY IN HAZARD EVALUATION
Academic Press, London, 1973

Inhalation hazards are emphasized in this book which describes the deposition, absorption and clearance of particulate matter in the lungs; particle dynamics and aerosol stability; particle size measurement and distribution; and theory of aerosol generation. The chapter on air samplers discusses the characterization and separation of the respirable fraction of an aerosol. The problems associated with estimating and quantifying aerosol concentrations by various filtration, electrostatic, optical and piezoelectric methods are mentioned.
[Review in: Food Cosmet. Toxicol. 13 (2), 272 (Apr. 1975)]

*21-0009
FLUOROCARBONS

Anon
STUDY PROPOSED TO RESOLVE OZONE DATA
Chem. Eng. News 53 (21): 6 (May 26, 1975)

Congress urged by scientists to authorize two-three year study of fluorocarbon problem, probably under NASA, and to fund long-term research on the terrestrial, biological, and climatic effects of increased UV radiation.

New studies now indicate that previous calculations of ozone loss in stratosphere were too big by about 300%. Also, although the hydroxyl radical is a key species in all calculations made, it has not yet been detected in the stratosphere.

FLUOROCARBONS

See also: 21-0013, 4,4'-Methylenebis (2-chloroaniline)

21-0010
HALOETHERS

Thiess, A.M. et al
ON THE TOXICOLOGY OF DICHLORODIMETHYLETHER -- SUSPICION OF CANCEROGENIC EFFECT ALSO ON MAN
Zentbl. ArbMed. ArbSchutz 23: 97 (1973)

The long-term carcinogenic potential of bis-chloromethyl ether (BCME) in animals and man has been recognized in the U.S. and Britain. This study indicates the potential danger of acute exposure.

A spray of BCME resulting from adding aluminum chloride too quickly into a vat containing BCME in methylene chloride caused burns, lung fibrosis and the death of an employee, protected by a breathing mask and rubber clothing. It also caused eye irritation in other workers slightly exposed to the spray.

A review of animal studies showed, among other effects, that death occurred to rats exposed for three minutes to an atmosphere saturated with BCME vapor at 20°C. Also, BCME was involved in 13 accidents in the factory between 1964 and 1971, causing two cases of eye damage and mild local skin damage. Eight cases of lung cancer reported may have been caused by unknown levels of exposure to BCME. Thus, BCME may be a short-term as well as a long-term hazard.

[Abstr. in: Food Cosmet Toxicol 13 (1): 154 (Feb. 1975)]

21-0011
HALOETHERS

Tou, James C. et al
ANALYSIS OF A NON-CROSSLINKED, WATER SOLUBLE ANION EXCHANGE RESIN FOR THE POSSIBLE PRESENCE OF PARTS PER BILLION LEVEL OF BIS(CHLOROMETHYL) ETHER
Amer. Ind. Hyg. Assoc. J. 36 (5): 374-8 (1975)

There was no evidence of bis-chloromethyl ether (bis-CME) in an aqueous solution of a non-crosslinked anion exchange resin at a concentration of approximately 33% at the detection limit ∿ 10 ppb using the hollow fiber probe-mass spectrometric technique. Commercial anion exchange resins contain 50% water within the bead matrix and kinetic data show bis-CME hydrolyzes rapidly in the resin solution.

Anon
ALTERNATIVE FUELS FOR AUTOS STUDIED
Chem. Eng. News 53 (21): 25 (May 25, 1975)

According to Stanford Research Institute for some years yet the automobile will be fueled by petroleum-based fuels because of lack of sufficient supply of any other fuel. Future fuels, even though derived from nonpetroleum sources, may resemble today's liquid petroleum fuels. On the basis of net energy the most efficient use of either oil shale or coal would be production of synthetic crude, which if used to make synthetic gasoline or distillate fuels, would be compatible with today's automobile as well as with the existing petroleum refining system.

Under SRI's "maximum credible scenario" for deployment of coal liquefaction plants, production of 4 million bbl/day of oil is possible (but not necessarily "likely") by the year 2000. And this only by dint of a major national effort with capital expenditures of about $32 billion in 1973 dollars.

Johnson, P.R. et al
ELASTOMERS AND FLAMMABILITY
Rubber Age 107 (5): 29-37 (1975)

This review of the elastomers industry considers those applications where fire resistance is significant and summarizes technical knowledge on the flammability of elastomers. In 1972, 739 million lbs of elastomers were consumed in non-tire end use products. About 11% of this total consumption was for products having flame resistance requirements.

Flame retardants are discussed briefly, as is the oxygen index (OI) for fluoroelastomers. A table lists the combustion products of urethane cured with methylenebis (2-chloroaniline).

21-0014
MODEL ECOSYSTEMS

Metcalf, Robert L. et al
DEGRADATION AND ENVIRONMENTAL FATE OF 1-(2,6-DIFLUOROBENZOYL)-3-(4-CHLOROPHENYL) UREA
J. Agr. Food Chem. 23 (3): 359-64 (May/June 1975)

The degradation and environmental fate of the title compound, which is the insect growth regulator PH-6040, were studied in a laboratory model ecosystem, under photochemical stimulation, in soil, and by sheep liver microsomes. PH-6040 was moderately persistent in alga, snail, caterpillar, and mosquito larva. In *Gambusia*, however, the more efficient degradation of PH-6040 indicates that the compound does not bioconcentrate in the fish through food chain transfer. Degradative pathways are illustrated for the model ecosystem and photodegradation.

21-0015
MODEL ECOSYSTEMS

Rowe, Gilbert T. et al
BENTHIC NUTRIENT REGENERATION AND ITS COUPLING TO PRIMARY PRODUCTIVITY IN COASTAL WATERS
Nature 255 (5505): 215-17 (May 15, 1975)

Nutrient flux from nearshore sediments was measured in study aimed at proving the continental shelf to be a tightly coupled component of most nearshore ecosystems and to evaluate the function of the shallow sea floor in nutrient regeneration.

Anon
THE INDUCTION OF LUNG TUMOURS IN MICE BY URETHANE
Food Cosmet. Technol. 13 (2): 260-1 (Apr. 1975)

Brief review of published studies on the induction of lung tumors in mice indicates that the urethane lung-tumor-induction system is dose dependent in the number of tumor foci induced but not on the time of appearance of the tumors.

POLYURETHANES

See: 21-0013, 4,4'-Methylenebis (2-chloroaniline)

See: 21-0012, Liquefaction and Gasification of Coal

Seltzer, Richard J.
REACTIONS GROW TO TRICHLOROETHYLENE ALERT
Chem. Eng. News 53 (20): 41-3 (May 19, 1975)

NCI's memo of alert indicating the potential carcinogenicity of trichloroethylene in animals stirs producers and users to propose industry-sponsored research program and activates NIOSH, OSHA, FDA, etc. to seek information.

Major use of trichloroethylene, vapor degreasing of metal parts, has declined since it was labeled a photochemically reactive smog component, but this use still accounts 90 to 95% of the trichloroethylene produced.

U.S. production of 434 million lb in 1974 is 29% less than in 1970. Uses, other than vapor degreasing, include food extractions, anesthetics, diluent in paints and adhesives, removing oils from fabrics and fibers, flushing liquid oxygen during aerospace operations.

Main hazards seen for users rather than producers because the compound is made in a closed system.

OSHA recommends a ceiling of 100 ppm in air (time-weighted average during 8 hours), a 200 ppm maximum for 15 minutes' exposure and a 300-ppm limit for trichloroethylene worker exposure.

21-0018
VINYL CHLORIDE

Bibra, A.M.S.
THE VINYL CHLORIDE PROBLEM
Food Cosmet. Toxicol. 13 (2): 275-6 (Apr. 1975)

Review of recent published studies on vinyl chloride carcinogenicity indicates that had the tumors been of a less rare type than the angiosarcomas reported recently, the potential hazard of vinyl chloride might have been detected sooner. Other work indicates that some forms of vinyl chloride exposure may cause tumors in organs other than liver.

21-0019
VINYL CHLORIDE

van Esch, G.J. and van Logten, M.J.
VINYL CHLORIDE: A REPORT OF A EUROPEAN ASSESSMENT
Food Cosmet. Toxicol. 13 (1): 121-39 (Feb. 1975)

Toxicological and migration data on vinyl chloride, especially its potential carcinogenicity, were discussed at a 26 March 1974 meeting in Bilthoven, the Netherlands. Known, essential points of VC's toxicity and carcinogenicity are summarized, and the relationship between chemical structure and toxicological effects is discussed.

The greatest problem lies in industrial exposure to vinyl chloride, but final solution demands evaluation of such additional data as epidemiological studies in man concerning vinyl-chloride linked diseases, studies determining whether its effects on liver resemble those of selenium or nitrosamines, levels of industrial and environmental exposure, levels of VC in potable water, etc.

21-0020
VINYL CHLORIDE

Myers, S.A. et al
DETERMINATION OF VINYL CHLORIDE MONOMER AT THE SUB-PPM LEVEL USING A PERSONAL MONITOR
Amer. Ind. Hyg. Assoc. J. 36 (5): 332-7 (1975)

To comply with government standards for vinyl chloride, a technique to obtain "breathing zone" samples of industrial workers with sensitivity capable of detecting vinyl chloride monomer (VCM) below 1 ppm was investigated. The method described consists of sampling vinyl chloride in ambient air, drawing it through a glass tube packed with activated charcoal, and analysis of the sample with a flame ionization gas chromatograph. This procedure has a sensitivity for detection at a level of 100-ppb VCM in a 1-liter or 20-ppb in a 5-liter sample and is considered suitable for a number of organic vapors.

21-0021
VINYL CHLORIDE

Anon
NEW FILTER FOR RESPIRATORS CUTS VCM TO 0.1 PPM.
Chem. Wk. 116 (21): 48 (May 21, 1975)

The vapesorber, a new device for filtering vinyl chloride monomer (VCM) from a worker's life support respirator, uses an activated carbon bed to absorb VCM. Developed by Selas Corp., Dresher, PA, the device has achieved removal levels down to 0.1 ppm at General Tire's Ashtabula, OH, plant.

Ricci, Larry J.
POLYMERS' RAW-MATERIAL BASE EXPECTED TO BROADEN
Chem. Eng. 82 (11): 64-6 (May 26, 1975)

Natural oils, wood, and starch are being investigated as possible starting materials for plastics, resins, fibers and synthetic rubbers in an effort to counteract rising petroleum prices.

In a table showing wood requirements for polymer production (1973 basis) an estimated 3.1 million tons of lignocellulose (cellulose derived) is seen as needed for production of 2.28 million tons of PVC.

VINYL CHLORIDE

See: *21-0003, Aryl Phosphates

*21-0023
ETHYLENE DIBROMIDE

Anon
EXPERIMENTAL CARCINOGENESIS FROM FUMIGANTS
Food Cosmet. Toxicol. 13 (1): 144-5 (Feb. 1975)

Included in this brief review is the fumigant, ethylene dibromide (EDB), which has a known hepatoxic potential and has been reported to induce a rise in liver triglyceride concentration in rats within 12 hr. A proposed threshold limit for EDB in working places is 200 ppm.

Rats given intragastric doses (40 and 80 mg/kg/day) of EDB developed squamous-cell carcinomas of the stomach and a similar development in mice seems likely, based on preliminary data.

Because of its potential health hazard, inhalation or absorption via other route of EDB should be avoided, pending more knowledge of its effects

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*21-0024
ETHYLENE DIBROMIDE

Bielorai, Rachel and Alumot, Eugenia
THE TEMPERATURE EFFECT ON FUMIGANT DESORPTION FROM CEREAL GRAIN
J. Agric. Food Chem. 23 (3): 426-9 (1975)

It is concluded that desorption of halogenated fumigant residues from whole cereal grain is speeded up at low (14-17°) as opposed to high (30-37°) temperature. Steam distillation and cold extraction were used for several fumigation experiments with ethylene dibromide, carbon tetrachloride, and trichloroethylene. Tables show residues of ethylene dibromide in corn, soybean, lentils, and chick-peas at two temperatures.

21-0025
GENERAL INFORMATION

Anon
ANOTHER SWEETENER SNAG
Chem. Wk. 116 (21): 25 (May 21, 1975)

Diketopiperazine (DKP), a breakdown product of the artificial sweetner, aspartame, has been found to cause uterine polyps in rats. G.D. Searle and General Foods will hold off marketing of the sweetener until additional studies are made on DKP.

21-0026
GENERAL INFORMATION

Carter, Coleman D. et al
TETRACHLORODIBENZODIOXIN: AN ACCIDENTAL POISONING EPISODE IN HORSE ARENAS
Science 188 (4189): 738-40 (May 16, 1975)

The toxic effects of 2,3,7,8-tetrachlorodibenzodioxin (TCDD) were illustrated by the deaths of several horses, numerous chickens, and several cases of human illness. These effects followed the spraying of waste oil sludge, contaminated by TCDD, on riding arenas and dirt roads for dust control The reported incidents stress the need for proper disposal of toxic chemical wastes. TCDD, a very stable compound with a half-life in soil of about 1 year, has an oral LD_{50} for many animal species in the mg/kg range. In mammals, it is slowly excreted in the feces and urine and, apparently, accumulates in body tissue after recurrent exposure.

21-0027
GENERAL INFORMATION

Anon
RADIOACTIVE POLONIUM IN TOBACCO MAY CONTRIBUTE TO LUNG CANCER. . .
Chem. Eng. News 53 (20): 38 (May 19, 1975)

Lung tumors were induced by exposing a significant number of hamsters to radioactive polonium at levels similar to those in tobacco. An in situ source of alpha radiation is provided when ^{210}Po is burned and forms insoluble particles that deposit in the lung and cannot be eliminated. This research was performed at the School of Public Health, Harvard University.

21-0028
GENERAL INFORMATION

Little, John B. et al
LUNG CANCER INDUCED IN HAMSTERS BY LOW DOSES OF ALPHA RADIATION FROM POLONIUM-210
Science 188 (4189): 737-8 (May 16, 1975)

Multiple intratracheal instillations of polonium-210 induced lung cancer in 9 to 53% of the experimental hamsters. The local alpha radiation doses were in the same order of magnitude (lifetime exposures of 15 to 300 rads to the lungs) as those received by cigarette smokers (estimated at 20 rads to areas of the bronchial epithelium) from deposited Po-210. The experimental work conducted in the Laboratory of Radiobiology at Harvard University School of Public Health tends to support the hypothesis that Po-210 or Pb-210 present in cigarette smoke contributes to human lung cancer in smokers.

21-0029
GENERAL INFORMATION

Anon
DYE RESTRICTIONS URGED
Soap Cosmet. Chem. Spec. 51 (5): 22 (May 1975)

Recommended human consumption of dye FD&C Red No. 2 is limited to 150 milligrams per day and its use in beverages restricted to not more than 50 ppm. Due to lack of information, the FDA advisory group reviewing the dye suggest further study of its effect on metabolism. The group tested the dye but did not substantiate 1971 claims by the Russians that it is carcinogenic, nor did its tests produce embryotoxic manifestations in rats.

21-0030
GENERAL INFORMATION

Anon
CPI MAY OPEN FILES TO CANCER RESEARCHERS
Chem. Wk. 116 (22): 8 (May 28, 1975)

Agreements to share medical data on potential cancer problems are being negotiated between some chemical companies and the National Cancer Institute.

21-0031
GENERAL INFORMATION

Anon
MEANWHILE, AN IN-SITU LEACHING PROCESS FOR URANIUM MINING. . .
Chem. Eng. 82 (10): 39 (May 12, 1975)

An in situ leaching process for uranium mining now onstream in a 250,000 lb/year yellowcake facility near George West, Texas, requires low capital and manpower, does not mar the land surface, and can handle low-grade ores. The use of an "undisclosed dilute alkali solution," which will be injected through 70 wells to leach uranium and withdrawn through 45 wells for aboveground uranium/solution separation, will be watched for its effects on underground water supplies.

21-0032
GENERAL INFORMATION

Anon
FDA UNCAPS LEGAL ISSUE
Chem. Wk. 116 (19): 19 (May 7, 1975)

Following environmental impact study, FDA will not ban the use of plastic beverage containers for beer and soft drinks in spite of fact that the bottles may cause litter problems. Decision raises question of FDA's responsibility being confined only to health issue and not other environmental concerns.

Runion, Howard E.
BENZENE IN GASOLINE
Amer. Ind. Hyg. Assoc. J. 36 (5): 338-50 (1975)

Benzene is considered the most important aromatic component in gasoline due to its volatility and performance characteristics combined with its low TLV (10 ppm). Gasoline compositions, exposure and toxicology were investigated, revealing a low level of total aromatics in the vapor phase vs. the liquid phase at 25°C. It was concluded that if TLV's for gasoline are met, 10 ppm TLV for benzene can not be exceeded; exposures to benzene in excess of 10 ppm would be intolerable for much more than a few minutes; a one-hour exposure of gasoline vapor at 500 ppm causes eye irritation which would be intolerable for 8-hour exposure due to discomfort.

McElroy, A.D. et al
WATER POLLUTION FROM NONPOINT SOURCES
Water Res. 9 (7): 675-81 (1975)

A brief discussion of the reaction of arsenapyrite and iron-arsenic sulfide associated with hard rock ores as a source of arsenic in mine drainage and a natural source of arsenic in Western waters.

*22-0002
ASBESTOS

Anon
RAYBESTOS MANHATTAN DEVELOPS SAFE WAY TO MANUFACTURE ASBESTOS PRODUCTS
Job Safety and Health Rpt. 5 (8): 78 (April 21, 1975)

A new wet process, trademarked Novatex, which will meet the Federal Safety Standards effective in July 1976 is already in commercial production of asbestos textile products.

*22-0003
ASBESTOS

Holst, David O. and Gehrke, Charles W.
CRUDE FIBER ANALYSIS WITHOUT ASBESTOS
J. Ass. Offic. Anal. Chem. 58 (3): 474-6 (1975)

A new method has been developed for the analysis of crude fiber which eliminates the use of asbestos for filtration and thereby the possible inhalation of asbestos fibers. The reagents and processing times used were those documented in the 12th edition (1975) of the AOAC's Official Methods of Analysis.

Warnock, M.L., and Churg, A.M.
ASSOCIATION OF ASBESTOS AND BRONCHOGENIC CARCINOMA IN A POPULATION WITH LOW ASBESTOS EXPOSURE
Cancer 35 (4): 1236-42 (1975)

Experimental results show a relationship of high ferruginous body counts with carcinoma of the lung in patients without known asbestos exposure. Although only one of 30 lung cancer patients had known occupational exposure to asbestos, the lung cancer group had significantly higher levels of ferruginous bodies in their lungs than did the 100 controls.

Even very low levels of asbestos, especially in combination with cigarette smoking, may have a carcinogenic effect.

22-0005
BORON

Hyder, S.Z. and Yasmin, S.
BORON TOLERANCE AND ENHANCEMENT OF BORON TOXICITY BY CHLORIDE IONS IN ALKALI SACATON DURING GERMINATION OF *SPOROBOLUS AIROIDES* TORR
Experientia 31 (4): 427-8 (15 Apr. 1975)

Alkali sacaton (*Sporobolus airoides*) is an important forage grass of southwestern United States. Since soil salinity and boron toxicity are closely associated, this study was undertaken to determine the boron tolerance and the interaction of boron with other ions of growth medium during germination of the grass. Tests showed a high degree of boron tolerance during germination. Chloride ions, even at low concentration were found to interact and enhance the toxicity of boron.

22-0006
BORON

Liu, F.T.Y.
POSTDEVELOPMENTAL EFFECTS OF BORON, FLUORIDE, AND THEIR COMBINATION ON DENTAL CARIES ACTIVITY IN THE RAT
J. Dent. Res. 54 (1): 97-103 (Jan-Feb 1975)

Experimental results showed that low-dose levels of boron in drinking water had no significant effect on dental caries. At higher dose levels, however, dental caries activity tended to increase compared with the controls. Furthermore, boron appeared to reduce the cariostatic effect of fluoride when given in combination.

Anon
FLAME RETARDANT ASBESTOS REINFORCED POLYPROPYLENE
Anti-Corros. Methods Mater. 22 (4): 24 (1975)

A unique flame retardant injection moulding compound called Arpylene APPN 2240 based on asbestos reinforced polypropylene, is offered by TBA Industrial Products Ltd.

FLAME RETARDANTS

See: 22-0018, Polyurethanes

*22-0008
FLUOROCARBONS

Anon
OREGON BANS AEROSOLS
Chem. Wk. 116 (23): 16 (June 4, 1975)

Oregon is the first state to prohibit the sale of aerosol products which contain trichloromonofluoroethane, difluorochloroethane, and other saturated chlorofluorocarbon propellants. The ban will be effective after March 1, 1977.

*22-0009
FLUOROCARBONS

Anon
HOUSE COMMITTEE AUTHORIZES 2-YEAR STUDY OF FLUOROCARBONS
Environ. Health Ltr. 14 (9): 3-4 (1 May 1975)

A two-year study by EPA on the effects of fluorocarbons on the atmosphere and possible ozone depletion has been authorized by the House Commerce subcommittee on health and environment. In addition, a three year research program to produce scientific evidence on the possible impact of fluorocarbons on the atmosphere is being administered by The Manufacturing Chemists Association with support between $3-5 million from a group of chemical companies from at least nine countries.

*22-0010
FLUOROCARBONS

Anon
INDUSTRY UNIT FORMED TO COORDINATE OZONE STUDY EFFORT
Air/Water Pollut. Rpt. 13 (9): 84 (March 3, 1975)

A new Federal interagency (IMOS) Inadvertent Modification of the Stratosphere held its first public meeting on February 27, 1975. A discussion of a new industry agency (COAS) Council on Atmospheric Sciences outlined the purpose and functions of this business group formed to study the many industry factors affected by the ozone-fluorocarbon issue.

*22-0011
FLUOROCARBONS

Anon
GUTOWSKY NAMED CHAIRMAN OF NAS OZONE STUDY
Air/Water Pollut. Rpt. 13 (12): 116 (March 24, 1975)

The National Academy of Sciences panel assessing the probable effects of halocarbons, such as the chlorofluoromethanes and other natural and man-made stratospheric pollutants, on the earth's ozone shield is being chaired by H.S. Gutowsky, University of Illinois. An additional ten to twelve U.S. and foreign panel members will participate in the year-long study funded jointly by EPA, NASA, NSF and NOA.

See: 22-0013, Model Ecosystems

Anon
LIQUID FUELS FROM COAL
Hydrocarbon Process. 54 (5): 119-2' (1975)

A review of the early technology for the production of liquid and gaseous hydrocarbons from coal. Processes now in operation are reviewed. Need for plants of greatly increased capacity is discussed as well as the economics of the processes using lower grade coals.

22-0013
MODEL ECOSYSTEMS

Lu, Po-Yung and Metcalf, Robert L.
ENVIRONMENTAL FATE AND BIODEGRADABILITY OF BENZENE DERIVATIVES AS STUDIED IN A MODEL AQUATIC ECOSYSTEM
Environ. Health Perspect. 10: 269-84 (April 1975)

A model aquatic ecosystem is devised for studying relatively volatile organic compounds and simulating direct discharge of chemical wastes into aquatic ecosystems. Six simple benzene derivatives (aniline, anisole, benzoic acid, chlorobenzene, nitrobenzene, and phthalic anhydride) and other important specialty chemicals: hexachlorobenzene, pentachlorophenol, 2,6-diethylaniline, and 3,5,6-trichloro-2-pyridinol were also chosen for study of environmental behavior and fate in the model aquatic ecosystem. Quantitative relationships of the intrinsic molecular properties of the environmental micropollutants with biological responses are established.

22-0014
MODEL ECOSYSTEMS

Anon
LITERATURE ON ECOLOGY
Environ. Rept. 5 (4): 193 (April 30, 1975)

"Literature on Ecology" is a list of serials on microfiche. Prepared for the First International Congress of Ecology at The Hague, it is available from Order Department, Inter Documentation Company, Poststrasse 14, Zug, Switzerland.

22-0015
MODEL ECOSYSTEMS

Anon
ACID PRECIPITATION AND THE FOREST ECOSYSTEM
Environ. Rept. 5 (4): 193 (Apr. 30, 1975)

The First International Symposium on "Acid Precipitation and The Forest Ecosystem", to be held May 12-15 at Ohio State University, will emphasize the potential long-term harmful effects on natural vegetation and crops growth. Information is available from L.S. Dochinger, USDA Forest Service, Northeastern Forest Experimentation Station, P.O. Box 365, Delaware, Ohio 43015.

Anon
OPTICAL BRIGHTENER
Textile Chem. Color. 7 (6), 46 (1975)

Fluolite XMF paste is ICI's new fluorescent brightening agent, especially effective on polyester. A technical bulletin giving information on chemical and physical properties and application methods may be obtained from the Dyes and Chemicals Division, ICI United States Inc., Wilmington, Delaware 19897.

22-0017
POLYURETHANES

Anon
TATE AND LYLE, A BRITISH CHEMICAL COMPANY IS...
Environ. 17 (4), 21 (June 1975)

Attempting to establish a sugar-based chemical industry, Britain's Tate and Lyle is test marketing its first product, a detergent made from sugar and tallow. The product is claimed to be nourishing as well as biodegradable and non-toxic. The chemical company has also developed a "sugar-based polyurethane foam."

22-0018
POLYURETHANES

Davis, John C.
URETHANE MAKERS BUILD-IN MORE FLAME PROTECTION
Chem. Eng. 82 (12), 44, 46, 48 (June 9, 1975)

A description of the development work being conducted by Olin Corp. and BASF Wyandotte to improve the flame retardant properties of polyurethane foam is presented. New methods for recycling urethane scrap, now in use by a number of companies, are also discussed. Building codes both Federal and local are considered in this article. Two flame retardant spray-on coatings for rigid polyurethane board are reviewed from standpoint of approved products.

22-0019
beta-PROPIOLACTONE

Seyfried, Thomas N.
INFLUENCE OF N_2 OR O_2 ON TWO ALKYLATING AGENTS IN *NEUROSPORA CRASSA*
Mutation Res. 28 (2): 155-62 (May 1975)

Results of tests on the mutagenic effect of beta-propiolactone on conidia of *Neurospora crassa* treated in an atmosphere of nitrogen or of oxygen indicate that neither N_2 or O_2 have an influence on the lethal and mutagenic effects of beta-propiolactone. The data are consistent with earlier observations.

Camisa, Alfred G.
ANALYSIS AND CHARACTERISTIC OF TRICHLOROETHYLENE WASTES
J. Water Pollut. Contr. Fed. 47 (5): 1021-31 (1975)

To detect and quantify trichloroethylene (TCE) wastes (in this instance, wastes from decaffeination of an instant coffee), a rapid and reproducible method for analysis was developed. With the introduction of TCE into activated sludge and digestion units, considerable sorption of TCE onto sludge solids was observed and estimates made to a maximum of 3,030 mg. TCE/kg solids. The adsorbed TCE is of potential concern in the anaerobic digestion system but TCE can be removed by air stripping to minimize the problem.

22-0021
SHALE OIL EXTRACTION AND REFINING

Anon
A COMMERCIAL-SIZE OIL-SHALE RETORT AND MINE WOULD BE BUILT. . .
Chem. Eng. 82 (12): 35 (June 9, 1975)

Based on a successful run, which produced 10,000 bbl of crude oil on the naval oil shale reserve near Rifle, Colorado, and which was part of a 17-company program, Paraho Oil Development Corp. is interested in scaling up twenty times to produce oil from a commercial-size retort. This scaled-up plant, with a 104-ft high and 42-ft diameter retort, is proposed to process 11,500 tons of oil shale daily into 7,300 barrels of oil and 8 billion BTUs of gas over a period of 2 1/2 years. Sixteen of the retorts would be required to produce 100,000 bbl daily on a commercial basis.

22-0022
SHALE OIL EXTRACTION AND REFINING

Anon
PARAHO REVEALS PLANS FOR SHALE OIL PROJECT
Chem. Eng. News 53 (22): 7 (June 2, 1975)

Paraho Development Corp. is seeking industry participants for a twenty times scale up of its pilot plant process at Anvil Points, Colorado, where the retort is only 10.5 feet in diameter and 75 feet high. Paraho now envisions the world's largest retort (104 ft high, 42 ft in diameter, capable of processing 11,500 tons/day of oil shale) as the basis for an eventual commercial plant, using up to 16 modules to feed a synthetic crude refinery with a capacity of 100,000 bbl daily. Paraho expects to be ready for the 20 times scale up in four years.

The current two-year pilot plant program has been operating well with "no serious environmental impacts." Its retort exceeds 85% thermal efficiency routinely; the retorting uses no water. Full-scale operations are expected to be "environmentally acceptable."

22-0023
VINYL CHLORIDE

Ives, N. Fred

SENSITIVE TRAPPING AND GAS CHROMATOGRAPHIC METHOD FOR VINYL CHLORIDE IN AIR SAMPLES

J. Ass. Offic. Anal. Chem. 58 (3): 457-60 (1975)

A simple, sensitive trapping and gas chromatographic method for determining vinyl chloride monomer (VCM) in air samples at 6 and 60 ppb (v/v) levels and recoveries from 79-105% is described. The small sample size and the realization of the maximum useful sensitivity of the gas-liquid chromatography are two of the advantages mentioned. The need for cooling with solid CO_2 (dry ice) is a given disadvantage.

22-0024
VINYL CHLORIDE

Anon

VINYL CHLORIDE MONOMER PRICE GOING UP AT PPG

Chem. Wk. 116 (23): 21 (June 4, 1975)

The 10-12.5¢/lb price of vinyl chloride monomer was increased 1¢/lb by PPG Industries Chemical Division, effective June 1 on spot sales and July 1 on contract sales.

22-0025
VINYL CHLORIDE

Anon
VINYL CHLORIDE EXPOSURE STANDARDS ARE FINALLY FINAL. . .
Chem. Eng. News 53 (22): 9 (June 2, 1975)

OSHA's worker exposure standards for vinyl chloride monomer of a 1-ppm time-weighted average for an 8-hour day and up to 5 ppm for periods of less than 15 minutes became effective April 1. The Supreme Court refused to grant an injunction stopping their implementation, as had been requested by the Society of the Plastics Industry.

22-0026
VINYL CHLORIDE

Anon
REDUCING VINYL CHLORIDE LEVELS WILL COST U.K. PVC MAKERS SOME $32 MILLION. . .
Chem. Eng. News 53 (22): 9 (June 2, 1975)

Britain's four PVC manufacturers (BP Chemicals International, British Industrial Plastics, Imperial Chemical Industries, and Vinatex) with an annual capacity of 410,000 metric tons anticipate spending $22 million just on plant modifications to achieve the below 25-ppm VCM workplace levels now required. Additionally, a $10 million investment is necessary to replace the 5-10% capacity loss expected from modifying existing units.

22-0027
VINYL CHLORIDE

Rosenberg, Rutger et al
TOXIC EFFECTS OF ALIPHATIC CHLORINATED BY-PRODUCTS FROM VINYL CHLORIDE PRODUCTION ON MARINE ANIMALS
Water Res. 9 (7): 607-12 (July 1975)

The experiments reported in this paper were designed to compare the acute toxic effects of wastes from one Swedish and one Norwegian plastics factory. Cod fish (Gadus morhua L.), shrimp (Crangon crangon) and a polychaete (Ophyryotrocha labronica) were the test species. The Swedish EDC-tar was the most toxic of the tested substances. Forty-eight hour LC50 was estimated at 5ppm for shrimp and 10 ppm for cod.

22-0028
VINYL CHLORIDE

Moore, John W.
THE VINYL CHLORIDE STORY
Chem. 48 (6): 12-6 (June 1975)

A review of the first interest in the harmful effects of vinyl chloride and the government efforts to provide standards and to police the areas where it is used. The author points out that many years may intervene between the initial use and its carcinogenic effect. The emphasis is on the need for regional government-supported and-operated testing laboratories to survey the industrial use of chemicals which may have carcinogenic, mutagenic or teratogenic effects.

22-0029
VINYL CHLORIDE

Anon
VINYL CHLORIDE INDUSTRY TO APPEAL OSHA STANDARD TO SUPREME COURT
Job Safety Health Report 5 (4): 31-2 (Feb. 24, 1975)

Society for the Plastics Industry, Inc. (SPI) petitioned the U.S. Supreme Court to review the permanent OSHA standard of 1 ppm vinyl chloride (VC) levels in work areas and sought a continuance of the temporary OSHA standard limiting worker exposure to 50 ppm pending final disposition and effective date of April 1. SPI is arguing that the standard would put an impossible engineering and work practice burden on the VC-PVC industry.

22-0030
VINYL CHLORIDE

Anon
IMPROVED EXPOSURE TEST
Chem. Wk. 116 (24): 18 (June 11, 1975)

Coconut-derived activated carbons, including PPG Industries' Carbon PCB 12 x 30, effectively monitor workers' exposure to vinyl chloride monomer traces for full 8-hour shifts, according to a Dow Chemical's Loren W. Severs. In contrast, porous polymers and other types of carbon adsorb VCM for only a few hours. Severs believes that the coconut carbon has potential for testing other chlorinated solvent vapors, such as methyl chloride and vinylidene chloride, and reports that NIOSH is interested in the studies.

Ducatman, Alan et al
VINYL CHLORIDE EXPOSURE AND HUMAN CHROMOSOME ABERRATIONS
Mutation Res. 31 (3): 163-68 (June 1975)

A significantly higher incidence of chromosome aberrations was observed in lymphocyte cultures from eleven vinyl chloride polymerization workers than in the ten controls. Caution in drawing conclusions on the basis of such a small sample is emphasized and additional research questions are outlined, but the general conclusion is that vinyl chloride has the potential for damaging chromosomes.

22-0032
GENERAL INFORMATION

McNutt, Neil S. et al
HEPATIC LESIONS IN MICE AFTER CONTINUOUS INHALATION EXPOSURE TO 1,1,1-TRICHLOROETHANE
Laboratory Investigation 32 (5): 642-54 (1975)

Mice inhaled 250 ppm or 1000 ppm of 1,1,1-trichloroethane in air continuously for 14 weeks, with some animals being sacrificed weekly. In general, no significant differences were observed between the exposed mice and controls in spontaneous activity, food and water intake, and hair coat appearance, but there was an increase in the liver weight of the mice exposed to the solvent, particularly at the 1000 ppm level.

Effects on the liver included significant changes in the centrilobular hepatocytes of mice inhaling the 1000 ppm; a peaking of liver triglyceride accumulation in the same group after 7 weeks of exposure, followed by a gradual, partial recovery (indicated by a decreased triglyceride level) by the 14th week; and hepatocytic necrosis in 40% of the mice exposed to 1000 ppm for 12 weeks. Except for differences in timing and degree of recovery, these effects resembled those previously reported for dichloromethane and, although apparently less severe, were also similar to the effects of carbon tetrachloride.

22-0033
GENERAL INFORMATION

Brubaker, Paul E. et al
NOBLE METALS: A TOXICOLOGICAL APPRAISAL OF POTENTIAL NEW ENVIRONMENTAL CONTAMINANTS
Environ. Health Perspect. 10: 39-56 (April 1975)

The public health benefits expected by reducing known hazardous emissions from mobile sources should not be compromised by increasing levels of other potentially hazardous unregulated emissions. Catalytic converters are going to be used to meet the statutory requirements on carbon monoxide and hydrocarbon emissions from light duty motor vehicles. Platinum and palladium metals are the catalytic materials to be used in these emission control devices. Preliminary experimental evidence and analysis of the impact of these control devices on the future use and demand for platinum indicates that this metal may appear at detectable levels in the environment by the end of this decade. At the present time, platinum and palladium are not present in the public environment and represent potentially new environmental contaminants as a consequence of use of this new abatement control technology. There is relatively little information available to adequately assess the potential health hazards that may be associated with exposure to these metals and their compounds. Analysis of the environmental problems and concerns associated with possible new environmental contaminants are discussed. Limited estimates are made on community exposure by use of a meteorological dispersion model. Biodegradation potential and attention is also given to the limited toxicological information available.

22-0034
GENERAL INFORMATION

LeRoy, Andre F.
INTERACTIONS OF PLATINUM METALS AND THEIR COMPLEXES IN BIOLOGICAL SYSTEMS
Environ. Health Perspect. 10: 73-83 (April 1975)

Platinum-metal oxidation catalysts are to be introduced in exhaust systems of many 1975 model-year automobiles in the U.S. to meet Clean Air Act standards. Small quantities of finely divided catalyst have been found issuing from prototype systems; platinum and palladium compounds may be found also.

Although platinum exhibits a remarkable resistance to oxidation and chemical attack, it reacts chemically under some conditions producing coordination complex compounds. Palladium reacts more readily than platinum.

Some platinum-metal complexes interact with biological systems as bacteriostatic, bacteriocidal, viricidal, and immunosuppressive agents. Workers chronically exposed to platinum complexes often develop asthma-like respiratory distress and skin reactions called platinosis. Platinum complexes used alone and in combination therapy with other drugs have recently emerged as effective agents in cancer chemotherapy. Understanding toxic and favorable interactions of metal species with living organisms requires basic information on quantities and chemical characteristics of complexes at trace concentrations in biological materials. Some basic chemical kinetic and thermodynamic data are presented to characterize the chemical behavior of the complex *cis*-$[Pt(NH_3)_2Cl_2]$ used therapeutically. A brief discussion of quantitation of platinum at nanogram levels in biological tissue is included.

22-0035
GENERAL INFORMATION

Moore, W. et al
PRELIMINARY STUDIES ON THE TOXICITY AND METABOLISM OF PALLADIUM AND PLATINUM
Environ. Health Perspect. 10: 63-71 (April 1975)

Preliminary studies on the LD_{50} of $PdCl_2$ following different routes of exposure and on the LD_{50} of $PtCl_4$ following intravenous exposure.

The retention, tissue distribution, and excretion of ^{103}Pd and ^{191}Pt in rats was determined following oral, intravenous, intratracheal, and inhalation exposure. The highest retention for both ^{103}Pd and ^{191}Pt was obtained following intravenous dosing, and the lowest retention occurred after oral dosing. Following a single oral dose, almost all of the ^{103}Pd and ^{191}Pt was excreted in the feces due to nonabsorption, whereas after intravenous dosing, similar quantities were excreted in both the urine and feces. Tissues containing the highest concentrations of these metals were the kidney, spleen and liver. Following intravenous dosing of pregnant rats, a small amount of ^{102}Pd and ^{191}Pt was found in the fetuses.

22-0036
GENERAL INFORMATION

Finklea, John F. et al
ESTIMATED CHANGES IN HUMAN EXPOSURE TO SUSPENDED SULFATE ATTRIBUTABLE TO EQUIPPING LIGHT-DUTY MOTOR VEHICLES WITH OXIDATION CATALYSTS
Environ. Health Perspect. 10: 29-34 (April 1975)

The potential environmental impact of equipping vehicles with oxidation catalysts is estimated. Three independent techniques are used to appraise community exposures. Incremental increases in suspended sulfates and sulfuric acid aerosols are evaluated in terms of the number of vehicles equipped with oxidation catalysts.

22-0037
GENERAL INFORMATION

French, Jean G.
EFFECTS OF SUSPENDED SULFATES ON HUMAN HEALTH
Environmental Health Perspect. 10: 35-7 (April 1975)

Recent evidence from epidemiologic studies conducted in several areas of the United States shows an association of excess risk of asthmatic attacks with elevated levels of suspended sulfates within specific temperature ranges. These findings are discussed in the context of experimental animal studies which tend to support these observations.

22-0038
GENERAL INFORMATION

Yoakum, Anna M. et al
METHOD DEVELOPMENT AND SUBSEQUENT SURVEY ANALYSIS OF BIOLOGICAL TISSUES FOR PLATINUM, LEAD, AND MANGANESE CONTENT
Environ. Health Perspect. 10: 85-93 (April 1975)

An emission spectrochemical method is described for the determination of trace quantities of platinum, lead, and manganese in biological tissues. Total energy burns in an argon-oxygen atmosphere are employed. Sample preparation, conditions of analysis, and preparation of standards are discussed. The precision of the method is consistently better than ±15%, and comparative analyses indicate comparable accuracies. Data obtained for experimental rat tissues and for selected autopsy tissues are presented.

22-0039
GENERAL INFORMATION

Johnson, D.E. et al
TRACE METALS IN OCCUPATIONALLY AND NONOCCUPATIONALLY EXPOSED INDIVIDUALS
Environ. Health Perspect. 10: 151-8 (April 1975)

An epidemiological survey was conducted in Houston, Texas on five trace metals in policemen, parking garage attendants, women living near freeways and three control groups of subjects. The controls were matched with the exposed groups for covariate information such as age, sex, smoking habits, ethnic background, socioeconomic status, hair color, and education. Each subject was sampled four times for blood, urine, hair, and feces, and these samples were analyzed for lead, cadmium, zinc, manganese, and copper. Lead and cadmium were correlated with airborne exposures but zinc, manganese and copper were not.

The second part of this paper deals with a market study of platinum and palladium markets and a design of an epidemiology survey of individuals occupationally and nonoccupationally exposed to these two metals. The market survey shows that although the catalytic muffler will have a major impact on the market, it is predicted that producers can meet these demands.

22-0040
GENERAL INFORMATION

Holbrook, David J. Jr. et al
STUDIES ON THE EVALUATION OF THE TOXICITY OF VARIOUS SALTS OF LEAD, MANGANESE, PLATINUM, AND PALLADIUM
Environ. Health Perspect. 10: 95-101 (April 1975)

Preliminary studies have been conducted on various parameters in order to assess the possible and relative toxicities of a number of metallic salts. Upon oral administration in lethal-dose experiments, two soluble Pt^{2+} salts were more toxic than the other salts tested. Following intraperitoneal injection in lethal-dose experiments, $PbCl_2$ was less toxic than several of the soluble or partially soluble salts of Pt^{2+}, Pd^{2+}, and Mn^{2+}. An intake of a total of approximately 250 mg of Pt^{2+} per rat in the drinking fluid over a 30-day interval did not affect the activities of aniline hydroxylase and aminopyrine demethylase in rat liver microsomes. In rats receiving soluble Pt^{2+} salts in the drinking fluid, the highest concentration of Pt was found in the kidney and an appreciable concentration was found in the liver.

22-0041
GENERAL INFORMATION

Jensen, Soren and Rosenberg, Rutger
DEGRADABILITY OF SOME CHLORINATED ALIPHATIC HYDROCARBONS IN SEA WATER AND STERILIZED WATER
Water Res. 9 (7): 659-661 (July 1975)

An analytical technique was developed which is sensitive enough to detect chlorinated hydrocarbons present in water at levels (0.1 - 1 ppm) potentially "sublethal" to organisms. Four different systems were used -- daylight open and daylight closed systems, darkness closed, and darkness 2 atm closed systems -- to study the degradability of the substances chloroform, 1,1,2-trichloroethane, 1,1,2-trichloroethene and 1,1,2,2,-tetrachloroethene in sea and sterilized fresh water. The closed systems are recommended for reliable values on degradability of substances in the ocean.

22-0042
GENERAL INFORMATION

Anon
CHEMICALS IN ENVIRONMENT
Environ. Rept. VI (2): 12 (May 30, 1975)

The National Academy of Sciences report "Principles for Evaluating Chemicals in the Environment," emphasizes urgent need for improved research techniques for identifying the complex pathways of potentially harmful chemicals and their effects on man. Efforts to obtain information on production and use of chemicals, emission rates, methods of disposal, and behavior patterns of chemicals in the environment are recommended together with improved computer modeling techniques for predicting chemical pathways. An additional suggestion focuses on detailed estimates of risks versus benefits of all chemicals before production and the possibility that an increased cost burden for potentially harmful chemicals would discourage their use by the marketplace.

22-0043
GENERAL INFORMATION

Anon
TOUGHER RADIATION LIMITS?
Chem. Wk. 116 (23): 16 (June 4, 1975)

Two types of standards are being proposed to reduce radiation escaping into the environment from operations of uranium fuel cycle-milling, chemical conversion, isotope enrichment, fuel fabrication and nuclear power reactors. First, maximum annual doses of radiation to an individual's entire body or to an organ will be limited to 25 millirems (lowered from 500 at present), with the exception of the thyroid, for which 75 millirems (compared to 1,500 millirems at present) will be the limit. Second, specific long-lived radioactive effluents will be limited as follows: Krypton-85 (50,000 curies/1,000 megawatt-years of electricity produced); iodine-129 (5 millicuries); plutonium and certain transuranium iso isotopes (0.5 millicurie). In the cases of Krypton-85 and iodine-129, required effluent controls have not been perfected and limits will not be mandatory until 1983.

Swartz, Joel
POISONING, THE NEW CHEMICALS
Environment 17 (4): 26-33 (June 1975)

There is a wealth of evidence that pesticides, under present conditions of usage, cause serious health problems for farm workers. The author has arrived at this conclusion as a result of studies on the incidence of pesticide related illness, and consultations with farm workers and their representatives. The severity of pesticide-related illnesses is probably greater than that attributed to all other occupational causes in any other type of work in California. The deficiency of existing regulations, and their lack of enforcement, both contribute to the situation.

23-0001
ACRYLONITRILE

Schwartz, W.A. et al
ENGINEERING AND COST STUDY OF AIR POLLUTION CONTROL FOR THE PETROCHEMICAL INDUSTRY, Vol. 2: ACRYLONITRILE MANUFACTURE
Air Products and Chemicals, Inc., Feb. 1975. EPA/450/3-73-006-b. PB-240 986/OWK

To assist EPA in determining those petrochemical processes for which standards should be promulgated, this second report of a series, discusses acrylonitrile manufacture. A process and industry description, an engineering description of available emission control systems, the cost of these systems, and the financial impact of emission control on the industry are presented together with air episode and plant inspection procedures.

23-0002
ACRYLONITRILE

Anon
ACRYLONITRILE WILL BE THE FOCUS OF A LONG-TERM EXPOSURE EFFECTS STUDY
Chem. Eng. News 53 (25): 15 (June 23, 1975)

To provide expanded data on acrylonitrile to ensure public and employee health, the Manufacturing Chemists Association (MCA) will administer a study concerning long-term exposure effects of the chemical for eight companies: American Cyanamid, Borg Warner Chemical, Dow Chemical, Du Pont, Monsanto, Standard Oil (Ohio), Tennessee Eastman, and Uniroyal Chemical. Although testing labs have not yet been selected, the cost of the study is estimated at $630,000.

23-0003
ARSENIC

Nishioka, H.
MUTAGENIC ACTIVITIES OF METAL COMPOUNDS IN BACTERIA
Mutation Res. 31 (3): 185-9 (June 1975)

Certain metal compounds cause health hazards, including genetic hazards, and some have been reported to induce point mutations in microrganisms. Some compounds of aluminum, antimony, arsenic and other metals cause chromosome aberrations in plants, insects, and cultured human cells.

Still unresolved, however, is the mechanism of mutation induction by these metals. Using a recently-developed simple but efficient method, the rec-assay, for screening of chemical mutagens, the author tested 56 metal compounds. Compounds, such as sodium arsenite, that showed positive results were examined for mutation induction in E. coli strains and the results are tabulated.

See also: 23-0011, Haloethers

*23-0004
ASBESTOS

Gibbs, G.W. and Hwang, C.Y.
PHYSICAL PARAMETERS OF AIRBORNE ASBESTOS FIBRES IN VARIOUS WORK ENVIRONMENTS—PRELIMINARY FINDINGS
Amer. Ind. Hyg. Assoc. J. 36 (6): 459-66 (1975)

Preliminary findings of a pilot investigation appear to support experimental work on animals, which indicates a relationship exists between asbestosis and the mass of airborne dust inhaled. Furthermore, the results of the reported work also suggest that primary malignant mesothelial tumors are related to fibers in a "specific range of fiber diameters and lengths." The physical parameters of asbestos fibers examined in this study are summarized under the various fiber types, such as chrysotile, amosite, and crocidolite.

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*23-0005
ASBESTOS

Anon
COMPLETE WATER REMOVAL OF ASBESTOS FIBERS. . .
Environ. Sci. Technol. 9 (6): 505 (1975)

According to George Klumb of Culligan International Co., complete removal of asbestos fibers from water is possible with reverse osmosis (RO), which is effective for fibers down to 0.22 μ and less. The 0.22 μ requirement for fiber removal is proposed by the FDA for solutions to be injected into the human body.

Loprieno, N.
INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) MONOGRAPHS ON THE EVALUATION OF CARCINOGENIC RISK OF CHEMICALS TO MAN: "RELEVANCE OF DATA ON MUTAGENICITY"
Mutation Res. 31 (3): 201 (June 1975)

The author explains that the IARC has decided to include mutagenicity data in its program to evaluate the potential carcinogenicity of chemicals to man because it now appears that most chemical carcinogens need metabolic activation to produce their biological effects. It has also been demonstrated that most chemical carcinogens, including chromate, vinyl chloride, β-naphthylamine, aflatoxin and benzidine which cause cancer in man, are mutagens when tested under procedures that combine microbial, mammalian or other animal cell systems as genetic targets with metabolic activation *in vitro* or *in vivo*.

*23-0007
FLUOROCARBONS

Anon
AEROSOL MAKERS BRACE FOR OZONE ORDEAL
Chem. Wk. 116 (24): 14-5 (June 11, 1975)

The $3-billion/yr aerosol industry anticipates a sales slowdown following a series of incidents indicating potential environmental and health hazards from the use of aerosol sprays. These include the fluorocarbon/ozone controversy, now being investigated by IMOS and by industry; the problem of spray can explosions, the need for child-proof caps, and the concern over the "sniffing" of the spray by youngsters. For the last, one researcher has suggested the use of allyl isothiocyanate - mustard oil - as a deterrent.

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*23-0008
FLUOROCARBONS

Anon
OZONE DEBATE PUTS PROPELLANTS UP IN THE AIR
Chem. Wk. 116 (25): 31,33 (June 18, 1975)

In its recently released report on fluorocarbons and ozone, the intergovernmental-agency task force on Inadvertent Modification of the Stratosphere (IMOS) recommended restriction on the use of fluorocarbons, especially F-11 and F-12, with the ban to be effective by January 1978.

Among criticisms from industry: IMOS has prejudged the results of research that requires 3 years to complete; other chemicals may also be sources of chlorine in stratosphere; recent studies indicate possibility that fluorocarbons do not contribute to ozone depletion.

Alternative propellants include hydrocarbons and CO_2. Both are cheaper than fluorocarbons but have not performed as well. Non-aerosol packages are being marketed.

Various studies on propellant toxicity indicate that the propellants are "safe for normal use."

*23-0009
FLUOROCARBONS

Anon
THE EARTH'S OZONE LAYER WILL BE STUDIED BY A SATELLITE. . .
Chem. Eng. News 53 (24): 20 (June 16, 1975)

Ozone density and vertical profile will be determined by measuring reflected light with an ultraviolet spectrophotometer in a satellite scheduled for a November launching. The space vehicle will have an on-board propulsion system that will permit maneuver ability to within 85 miles of the earth's surface. The satellite was built by RCA Astro-Electronics for NASA.

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*23-0010
FLUOROCARBONS

Anon
CHLOROFLUOROCARBONS BANNED IN OREGON
Chem. Eng. News 53 (25): 5-6 (June 23, 1975)

Oregon has passed a law banning the sale of aerosol products propelled by chlorofluorocarbons, effective February 1977. Although the Chemical Specialties Manufacturers Association has not yet commented on the bill, DuPont argues that it will have a negative economic impact and will not solve any potential problem.

S.C. Johnson & Son Inc. (Johnson Wax) also announced that it has stopped using chlorofluorocarbon propellants in its products.

23-0011
HALOETHERS

Pellizzari, Edo D. et al
COLLECTION AND ANALYSIS OF TRACE ORGANIC VAPOR POLLUTANTS IN AMBIENT ATMOSPHERES
TECHNIQUES FOR EVALUATING CONCENTRATION OF VAPORS BY SORBENT MEDIA
Environ. Sci. Technol. 9 (6): 552-55 (June 1975)

An instrumental technique designed to investigate the collection efficiency of sorbents as suitable trapping agents for concentrations of volatile hazardous substances in ambient atmosphere. Test compounds included β-propiolactone, bis-(2-chloroethyl) ether, and bis-(chloromethyl) ether. In general, all the polymeric sorbents appeared relatively efficient (≥ 90%) for extracting vapors from a flowing stream of 0.25ℓ/minute; tricresyl phosphate was least effective.

23-0012
HALOETHERS

Pellizzari, Edo D. et al
COLLECTION AND ANALYSIS OF TRACE ORGANIC VAPOR POLLUTANTS IN AMBIENT ATMOSPHERES
THERMAL DESORPTION OF ORGANIC VAPORS FROM SORBENT MEDIA
Environ. Sci. Technol. 9 (6): 556-60 (June 1975)

The design of an inlet manifold for desorption and transfer of hazardous substances to a gas-liquid chromatograph (GLC) is described. The extent to which several adsorbed vapors were recovered from Tenax GC using thermal desorption was ≥ 90% at 50 and 100 ng. Test compounds included β-propiolactone, bis-(chloromethyl) ether, and bis-(2-chloroethyl) ether.

Villanueva, Ellen C. et al
EVIDENCE OF CHLORODIBENZO-ρ-DIOXIN AND CHLORODIBENZOFURAN IN HEXACHLOROBENZENE
J. Agr. Food Chem. 22 (5): 916-7 (Sept/Oct. 1974)

Pentachloride was the major impurity identified in commercial hexachlorobenzene (HCB) samples. Other contaminants included hepta- and octachlorodibenzofuran and octachlorodibenzo-p-dioxin. Contaminants separated by fractional crystallization and alumina chromatography were identified by electron capture gas chromatography and by gas chromatography-mass spectrometry. The reported contaminants should be considered in studies of HCB toxicity.

Miller, J.A. and Mueller, F.X.
EVALUATION OF A CONTINUOUS INSTRUMENTAL METHOD FOR DETERMINATION OF ISOCYANATES
Amer. Ind. Hyg. Assoc. J. 36 (6): 477-83 (1975)

With the possibility of NIOSH lowering the standard for exposure to toluene diisocyanate (TDI) and diphenylmethane diisocyanate (MDI) to airborne concentrations of 0.005 ppm in the workroom, a laboratory and factory study was undertaken to compare instrumental and modified Marcali methods for monitoring TDI and MDI. The authors conclude that the Dunlop/ICI continuous detector is a valid alternative to the Marcali analysis.

Yu, Ching-Chieh and Sanborn, James R.
THE FATE OF PARATHION IN A MODEL ECOSYSTEM
Bull. Environ. Contam. Toxicol. 13 (5): 543-50 (1975)

Using a terrestrial-aquatic model ecosystem developed by R.L. Metcalf et al [Environ. Sci. Technol. 5, 709 (1971)], the authors studied parathion. They found that parathion did not accumulate to any great extent in the aquatic organisms of the ecosystem, and concluded that its continued use for insect control will not give rise to such widespread environmental contamination as occurred with DDT.

MODEL ECOSYSTEMS

See also: 23-0025, General Information

See: 23-0006, Benzidine

Anon
BLOOD BAG PLASTICIZER MAY DAMAGE LUNGS
Chem. Eng. News 53 (23): 5-6 (June 9, 1975)

Di(2-ethylhexyl) phthalate (DEHP), administered in high doses, can cause lung damage in experimental animals, according to studies conducted at Johns Hopkins University by Dr. R.J. Rubin.

DEHP, a plasticizer, is used in making polyvinyl chloride blood bags used to give blood transfusions to surgical patients.

Dr. Rubin believes that extraction of DEHP by blood could cause shock lung, often a cause of death, in patients receiving massive blood transfusions. Although he reported lung damage to laboratory rats given five to 10 times (per kg of body wt.) of DEHP that a human might receive during transfusion, Dr. Rubin has found no direct evidence of similar effects on humans. On rats, the effects have been observed at doses as low as 50 mg/kg of body wt. and studies are being made with lower dose levels.

Baxter Labs, whose Travenol Labs Division produces blood bags, argues that Rubin's experimental conditions vary from actual use and claims that DEHP in blood bags cannot cause shock lung in humans. Rubin injects rats with emulsified DEHP. Baxter feels that the lung damage to rats could be caused by the emulsifier or by the particulate DEHP in Rubin's dose form.

See: 23-0011, Haloethers

23-0012, Haloethers

Austern, Barry M. et al
GAS CHROMATOGRAPHIC DETERMINATION OF SELECTED ORGANIC COMPOUNDS ADDED TO WASTEWATER
Environ. Sci. Technol. 9 (6): 588-90 (1975)

Eleven organic compounds, each of environmental concern, were analyzed in water or wastewater using precise methods with sensitivity to the parts-per-billion range. The compounds were styrene, p-xylene, ethylbenzene, nitrobenzene, acetophenone, o-anisidine, anethole, trichloroethylene, turpentine, nonylphenol and dimethyl phthalate.

See: 23-0006, Benzidine

See: *23-0016, Phthalates

23-0018
GENERAL INFORMATION

Osterberg, Robert E. et al
AN EVALUATION OF THE MUTAGENIC POTENTIAL OF AN AEROSOL SPRAY ADHESIVE IN THE RAT
Mutation Res. 31 (3): 169-73 (June 1975)

Forty adult rats were exposed to 10, 15 or 20 g of a commercially available aersol adhesive formulation 21 times over a 33 day period. Examination of bone marrow cells indicated a cytotoxic effect. Dose-dependent toxicity appeared in eye and nasal irritation, ataxia, hyperexcitability, and clonic convulsions. No statistically significant chromosome and chromatid aberrations were observed.

23-0019
GENERAL INFORMATION

Butler, James N.
PELAGIC TAR
Scientific American 232 (16): 90-7 (June 1975)

A review of the tarry residues of petroleum that are found on the ocean surface, their composition, distribution, and potential effects on marine organisms.

Although some organisms use tar lumps as a solid substrate to grow on and other organisms can absorb the hydrocarbons with no apparent adverse effects, one possible problem could be damage to the subtle chemical communications signals that are thought to exist between marine organisms.

23-0020
GENERAL INFORMATION

Murray, Chris
PHOSPHAZENE POLYMERS ATTRACT GROWING INTEREST
Chem. Eng. News 53 (24): 22-3 (June 16, 1975)

Phosphazene polymers, consisting of alternating phosphorus and nitrogen atoms, are arousing new interest as potentially useful, diverse commercial products. Possible uses include rigid plastics, elastomers, flexible films, and expanded foams. As coatings, the properties of the poly(aryloxyphosphazenes) suggest outdoor uses as metal coatings and wire insulation and, in some instances, electrical insulation.

Polyphosphazene foams offer flame retardance, suggesting use in insulation and upholstery. Another possibility is in medical applications. One current drawback is high cost.

23-0021
GENERAL INFORMATION

Anon
PLUTONIUM IS MUCH LESS HAZARDOUS. . .
Chem. Eng. News 53 (24): 20 (June 16, 1975)

One cancer-caused fatality 15 to 45 years later for each 15 grams of reactor plutonium released without warning or for each 150 grams released with warning might be the result of dispersing the plutonium in a city. These were the estimates reported by Dr. Bernard L. Cohen, Director of the University of Pittsburgh's Scaife Nuclear Physics Laboratory, to Oak Ridge Associated Universities' Institute for Energy Analysis.

23-0022
GENERAL INFORMATION

Anon
A SHELLFISH-KILL. . .
Chem. Eng. 82 (13): 77 (June 23, 1975)

Copper-containing corrosion products, flushed from nuclear-power units of a Pacific Gas & Electric Company plant last summer, killed 1000 abalone (company estimates) or 14,000 (state estimates). As a result, PG & E is using titanium to replace 58,216 ft of copper nickel tubing in each condenser of its two coastal units at Diablo Canyon, California, at a cost of over $5 million. Substitution is not expected to delay the completion of PG & E's $900-million power facility.

23-0023
GENERAL INFORMATION

Searle, C.E. et al
CARCINOGENICITY AND MUTAGENICITY TESTS OF SOME HAIR COLOURANTS AND CONSTITUENTS
Nature 255 (5508): 506-7 (June 5, 1975)

The authors studies of two nitrophenylendiamine dyes used in hair colorants indicate that they show mutagenic activity in bacteria. Some hair colorants containing nitrophenylenediamines were carcinogenic in mice.

23-0024
GENERAL INFORMATION

Prakash, Louise et al, Editors
MOLECULAR AND ENVIRONMENTAL ASPECTS OF MUTAGENESIS
Charles C. Thomas, Springfield, Ill. 62717. 1975. 295pp. $24.50

This book critically examines the known information on toxicity as related to molecular and environmental aspects of mutagenesis and points out areas of lesser knowledge in the field as well as the status of current skills.

23-0025
GENERAL INFORMATION

Nevissi, A. and Schell, W.R.
^{210}Po AND ^{239}Pu, ^{240}Pu IN BIOLOGICAL AND WATER SAMPLES FROM THE BIKINI AND ENIWETOK ATOLLS
Nature 255 (5506):321-3 (May 22, 1975)

Compares the concentrations of the naturally produced radionuclide, polonium-210, with those of plutonium-239 and 240, which are produced by nuclear detonations, in the marine environment and their uptake by biota.

All specimens measured, except the samples of turtle liver and surgeon fish viscera, had concentration factors as much as 100 times greater than those for the two plutonium radionuclides.

Anon
CANCER DEATH RATES OF RETIRED WASHINGTON SMELTER WORKERS. . .
Environ. Sci. Technol. 9 (6): 503 (1975)

Some 419 workers of American Smelting & Refining Co's (ASARCO) Tacoma, Washington smelter, who retired between 1 Jan. 1961 and 31 December 1973 were the subject of an epidemiological study. Findings showed cancer death rates of the smelter workers to be higher than those of the state's male residents. Installation of new dust and fume control equipment and stricter enforcement of the use of protective respiratory equipment in exposed areas are some of the health protection measures now adopted by ASARCO.

Anon
BOTTLE WINS BATTLE
Chem. Wk. 116 (26): 18-9 (June 25, 1975)

Based on tests by Monsanto in which "extremely sensitive detection methods" were used, the FDA is satisfied that there will be no migration of chemicals from the acrylonitrile bottle when used as a soft-drink container.

Fear that such chemicals as hydrogen cyanide, acrylonitrile, acrolein and methyl acrylate could migrate into the bottled beverage were expressed by the Environmental Action Foundation, after tests by the Society of the Plastics Industry indicated that the incineration of acrylonitrile bottles yielded levels of those topic substances that were greater than the OSHA limits.

Meanwhile, the Manufacturing Chemists Assoc. is studying the long-term effects of exposure to acrylonitrile. The eight chemical companies sponsoring the study claim that industrial workers are not adversely affected by acrylonitrile when handled as recommended by the Congress of Industrial and Governmental Hygienists.

24-0002
ARSENIC

Zingaro, Ralph A. and Irgolic, Kurt J.
ARSENIC (Letter to Editor)
Chem. Eng. News 53 (26): 3 (June 30, 1975)

On the basis of their research, the authors argue that there is as yet no conclusive proof of the carcinogenicity of arsenic (compounds).

24-0003
ARSENIC

Gosink, Thomas A.
GC IN ENVIRONMENTAL ANALYSIS
Environ. Sci. Technol. 9 (7): 630-4 (1975)

In this review of gas chromatography as a method to quantitate various gases, complex organic molecules, metals, anions, and pesticides under lab or field conditions, the author mention one specific advantage of chromatography - that of differentiating among the various chemical species of arsenic present in a system under study.

See also: 24-0041, General Information

24-0004
BENZIDINE

Anon
EPA/OSHA REGULATION THREATENS U.S. DYE MANUFACTURING INDUSTRY
Text. Chemist and Colorist 7 (7): 5 (1975)

EPA/OSHA regulations seen as cause of economic and business survival problems for the dye manufacturing industry. OSHA requirements have, apparently, caused some companies to discontinue manufacture of some special dyes based on benzidine and naphthylamine.

24-0005
BENZIDINE

Haley, T.J.
BENZIDINE REVISITED: A REVIEW OF THE LITERATURE AND PROBLEMS ASSOCIATED WITH THE USE OF BENZIDINE AND ITS CONGENERS
Clinical Toxicol. 8 (1): 13-42 (1975)

Based on a review of 106 references from 1895 through 1975, the author concludes that benzidine and its congeners, including 3,3'-dichlorobenzidine, warrant a series of research studies, and industrial hygienic and epidemiologic programs, to protect individuals from preventable chemically induced cancer.

Lunde, Gulbrand et al
THE SUM OF CHLORINATED AND OF BROMINATED NON-POLAR HYDROCARBONS IN WATER
Bull. Environ. Contam. Toxicol. 13 (6): 656-61 (1975)

Experiments with non-destructive neutron activation analysis indicate that the method may be useful in the control of chlorinated hydrocarbons in water While test results gave values for the PCB level in water samples, they also indicated the presence of other non-polar organic bound chlorine and, in some instances, of organically bound non-polar bromine.

The suggested use of the ratio of the sum of chlorine to bromine, with chlorine as a common parameter, may also help to determine the origin of chlorine-containing hydrocarbons in the aquatic environment. In this study, a PVC production plant in the area may have given rise to some of the organic micropollutants.

See: 24-0005, Benzidine

*24-0007
FLUOROCARBONS

Anon
MODEL PREDICTS EFFECTS ON EARTH'S OZONE SHIELD
JAPCA 25 (6): 644-5, 659 (1975)

A theoretical chemical-diffusion model to assess the impact of human activities on the ozone layer is offered by Paul J. Crutzen, National Oceanic and Atmospheric Administration (NOAA), Environmental Research Labs (ERL), Boulder, Colo.

Total ozone in the atmosphere is very small and not totally effective in preventing all ultraviolet radiation from reaching the Earth's surface. Nevertheless, any large reduction in total ozone would have a big impact on the Earth's ecological and biological systems. Various ways of altering the ozone shield are discussed, including the chlorofluoromethanes. Use of the latter at double the 1972 rate could cause about a 15% reduction in total ozone with resulting increases in UV radiation and significant climatic changes. More study is needed on the related meteorological and photochemical processes and on all activities that could reduce the ozone content of the atmosphere.

*24-0008
FLUOROCARBONS

Anon
PAM BAN DENIED
Chem. Wk. 117 (1): 15 (July 2, 1975)

According to the Consumer Product Safety Commission, the aerosol cooking spray, PAM, which is propelled by a combination fluorocarbon and hydrocarbon, is a food additive. Therefore, any ban on its use should come from FDA. However, FDA claims that its rules for warning labels on certain propellants is sufficient. FDA plans to ask manufacturers of food, drug and cosmetic products for information on products containing fluorocarbons, including the amount used and the manner of its distribution.

*24-0009
FLUOROCARBONS

Anon
FLUOROCARBONS: CLEARLY SAFE OR BANNED BY '78?
Aerosol Age 20 (6): 14a, 14b (1975)

The impact of the prematurely released IMOS report on the airconditioning and refrigeration industry, as well as the total aerosol industry, is discussed. Criticisms of the IMOS report, which virtually bans aerosols using fluorocarbons by January 1978, include the almost total ignoring of high concentrations of methyl chloride (a potential source of chlorine) in the troposphere and the limited discussion of ion molecular reactions. The latter could be a major atmospheric sink for chlorine.

The IMOS report may cause economic havoc for the airconditioning and refrigeration industry.

*24-0010
FLUOROCARBONS

Anon
ALLIED'S ORFEO STRESSES UNCERTAINTIES IN OZONE THEORY
Aerosol Age 20 (6): 38-9. 42-3, 56,58,60,62-3 (1975)

The rather detailed recapping of the ozone controversy made by S.Robert Orfeo of Allied Chemical to the Standing Committee on Environmental Conservation of the New York State Assembly is presented here.

Focal compounds in this controversy are fluorocarbons 11 and 12, used primarily as aerosol propellants but also as airconditioning refrigerants and "blowing agents" in foam manufacture. Alternative refrigerants -- ammonia, sulfur dioxide, methyl chloride, hydrocarbons -- have toxic, explosive and/or corrosive properties and, if used, would necessitate the redesign of present equipment. The controversial theory is reviewed, the research projects sponsored by industry are discussed, and current scientific knowledge is summarized. In conclusion, Orfeo claims that the Rowland-Molina theory has not been substantiated, that there has been an increase of ozone in the stratosphere where there also exists many chlorine compounds not derived from fluorocarbons, and a three-year delay in banning aerosols would only raise by 0.5% the 1.2% ozone depletion predicted by 1990, if production were to stop now.

*24-0111
FLUOROCARBONS

Federal Task Force on Inadvertant Modification of the
Stratosphere (IMOS)
FLUOROCARBONS AND THE ENVIRONMENT
Council on Environmental Quality and the Federal Council for Science and
Technology. June 1975. 109pp

Conclusions reached by IMOS are that fluorocarbons released to the environment are a legitimate cause for concern and that, barring any new scientific evidence to the contrary, use of fluorocarbons-11 and -12 may have to be restricted to replacement of fluids in existing refrigeration and air-conditioning equipment and to closed recycle systems or such other uses that would not allow release to the atmosphere.

Should the National Academy of Sciences confirm these findings, IMOS recommends Federal restrictions be imposed on the use of fluorocarbons by January 1978.

*24-0012
FLUOROCARBONS

Muir, Warren A. and Pegler, Carroll Leslie
FURTHER INFORMATION ON THE FLUOROCARBON INDUSTRY AND ON POTENTIAL ECONOMIC IMPACTS OF RESTRICTION OF FLUOROCARBON PRODUCTION
Domestic and International Business Administration, U.S. Dept. of Commerce.
(June 1975). 12pp.

In this preliminary analysis of the possible impacts on the U.S. economy of three alternative restrictions on the uses of fluorocarbons (submitted to IMOS too late to be included in its report, "Fluorocarbons and the Environment"), Commerce Dept. analysts estimate that a better than 50% cut in the $400 to $450 million/year would follow any government ban on the use of those chemicals in aerosols and foamed plastics and any limitation of their use in refrigeration to replacement of fluids in existing equipment. Biggest loss of employment (about 500,000) would come in the refrigeration industry with smaller loss in chemical industry employment. Even postponing such changes until 1980 would not change the economic impact because the extra two years would still not allow time for the development of suitable substitutes. The replacement cost of U.S. fluorocarbon manufacturing facilities is set at about $300 million; that of air conditioning and refrigeration equipment at about $50 billion. Annual production of fluorocarbons requires 40% of total U.S. production of hydrofluoric acid, 80% of carbon tetrachloride production, and 56% of chloroform production. Aerosol formulations account for 50 to 30% of total annual ethanol production.

*24-0013
FLUOROCARBONS

Anon
CARBON DIOXIDE AS AN AEROSOL PROPELLANT...
Chem. Eng. News 53 (26): 16 (June 30, 1975)

The potential ban on chlorofluorocarbon aerosols may reopen the market for carbon dioxide as a propellant. According to one carbon dioxide producer, new valve orifice and actuator designs permit a carbon dioxide spray that meets the fine, even requirements of an aerosol propellant. In the offing, too, is high-speed filling equipment, another necessity. By the Fall of 1975, numerous personal and household product manufacturers could switch to full-line production with carbon dioxide.

*12-0014
FLUOROCARBONS

Anon
1974 AEROSOL OUTPUT OFF 6.2 PERCENT
Soap, Cosmet. Chem. Spec. 51 (6): 14 (1975)

In the industry's second decline since the marketing of aerosols started in the late 1940's, output in 1974 dropped 6.2% from the 1973 level. The ozone scare has had less impact on consumers than on marketers. The latter are restricting inventories and seeking alternative dispensing methods, such as pump type sprays.

A bright spot in aerosol's adverse publicity of late is a report from the National Oceanic and Atmospheric Administration that no evidence has been found to prove that the recent thinning of the ozone layer has been caused by human activities.

*24-0015
FLUOROCARBONS

Donohue, Janet
AEROSOLS TERMED SAFE AT CPSC HEARINGS
Soap, Cosmet. Chem. Spec. 51 (6): 71-2, 74-5 (1975)

Industry spokesmen reported at CPSC public hearing that fluorocarbon propellants in aerosols are "safe when used as directed." The CPSC staff has recommended that no ban be placed on the use of aerosol sprays, citing only about one in 600,000 consumers might be in danger from their use, while only one in every 1.2 million cans might explode.

Discussions centered about the "sniffing" problem, the comparative cost of non-aerosol packaging, problems with paints, possible hazards resulting from long-term use of aerosol products, and inadvertent misuse.

*24-0016
FLUOROCARBONS

Lee, J.E.
HYDROCARBONS FOR INSECTICIDES (Letter to Editor)
Chem. Wk. 117 (2): 5 (July 9, 1975)

Responding to an article and an editorial on aerosol makers response to the ozone problem (See: CATS #23-0027), the author refutes the statement that most insecticides are packed with chlorofluorocarbons, stating that most of them are packed with hydrocarbons. For most residual roach and ant type formulations, carbon dioxide is used as the propellant. Current use of chlorofluorocarbons is restricted to a limited number of insecticides and personal repellant products.

Dejonckheere, W. et al
RESIDUES OF QUINTOZENE, HEXACHLOROBENZENE, DICHLORAN AND PENTACHLOROANILINE IN SOIL AND LETTUCE
Bull. Environ. Contam. Toxicol. 13 (6): 720-9 (1975)

Hexachlorobenzene, an impurity in the technical grade quintozene (PCNB, pentachloronitrobenzene) used as a fungicide for lettuce in Belgium, is found as a residue in the soil and in lettuce.

24-0018
LIQUEFACTION AND GASIFICATION OF COAL

Anon
GE GIVES DETAILS OF LOW-BTU GAS PROCESS
Chem. Eng. News 53 (27): 25-6 (July 7, 1975)

The GEGAS process, an integrated coal gasification-gas cleaning process for production of low-Btu gas, is ready for pilot plant demonstration; operates successfully on a wide range of coals. One innovation of the process is the use of liquid membranes for acid gas removal.

GE anticipates that initial high cost can be offset by running the plant to produce liquid or gaseous fuel even when electrical turbine generators are not in use.

24-0019
LIQUEFACTION AND GASIFICATION OF COAL

Anon
POWER PLANTS THAT GASIFY COAL CAN RECOVER MINERALS
Chem. Wk. 117 (2): 25 (July 9, 1975)

A fringe benefit of coal gasification may be the recovery of minerals, such as bauxite and pure alumina. According to L.D. Frawley of M.W. Kellogg's Houston research center, his company has recovered bauxite from the coal ash, using a molten salt bath that reacts with coal to produce fuel. The idea is feasible for power plants that will gasify coal in a combined cycle.

24-0020
LIQUEFACTION AND GASIFICATION OF COAL

Milios, P.
WATER REUSE AT A COAL GASIFICATION PLANT
Chem. Eng. Prog. 71 (6): 99-104 (1975)

Water reuse systems conceived for a coal gasification plant in New Mexico impose some process constraints but allow maximum use of a scarce resource without environmental damage. About 67% of total water entering the plant will be returned to the atmosphere as pure water vapor; 24% will be consumed in the process chemical reaction; 2.5% will be found in the ammonia by-product; and 6.5% will be escape in flue gases, ash, and cooling tower drifts.

24-0021
LIQUEFACTION AND GASIFICATION OF COAL

Anon
COAL GASIFICATION/WATER POLLUTION
Environ. Rept. 6 (4): 29 (June 30, 1975)

According to Bureau of Mines Report TPR86, "Mass Spectrometric Analysis of Product Water from Coal Gasification," potentially hazardous phenolic compounds are at the rate of 60 to 80% in the waste water from the Synthane coal gasification process. Mass spectrometric analysis indicates some 20 organic contaminants in the condensate waters from six gasified coals. Because approximately one-half ton of water will be recovered for every ton of coal gasified, a formidable pollution problem is possible. The report recommends in-depth studies on trace contaminants in coal gasification waters to insure development and use of proper purification systems.

24-0022
MODEL ECOSYSTEMS

Isensee, Allar R. and Jones, Gerald E.
DISTRIBUTION OF 2,3,7,8-TETRACHLORODIBENZO-*p*-DIOXIN (TCDD)
IN AQUATIC MODEL ECOSYSTEM
Environ. Sci. Technol. 9 (7): 668-72 (1975)

The availability distribution, and potential bioaccumulation of 2,3,7,8-tetrachloro-*p*-dioxin (TCDD) was studied in an aquatic model ecosystem. TCDD-treated soils were placed in the tanks, which were then filled with water the day before various aquatic organisms were added. At the end of the experiment, about 85-99% of the TCDD remained in the soil, indicating the stability of TCDD.

The aquatic organisms could be considered parts of two food chains: water → algae → snails and water → diatoms, protozoa, and rotifers → daphnids → fish. Bioaccumulation ratios of all organisms was directly related to water concentration, snails, *Gambusia*, and daphnids showing an average of 2.0-2.6 x 10^4 and duckweed, algae, and catfish averaging 4-9 x 10^3 times the water concentration. From these results it appears likely that under certain conditions, such as storm runoff discharges into a small pond, the surface soil or debris may contain sufficient TCDD to accumulate in fish or other aquatic organisms. But, the TCDD from 2,4,5-T spraying would undoubtedly be diluted enough after discharge into large lakes or other waters to insure no measurable accumulation.

24-0023
MODEL ECOSYSTEMS

Dunstan, William M.
PROBLEMS OF MEASURING AND PREDICTING INFLUENCE OF EFFLUENTS ON MARINE
PHYTOPLANKTON
Environ. Sci. Technol. 9 (7): 635-8 (1975)

Treated sewage effluents from municipalities and industry comprise most of the volume of wastes entering coastal waters. Because the high concentrations of nitrogen and phosphorus associated with these effluents are known to affect the growth of marine organisms, this study was undertaken to determine if simple measurements of N and P would permit measuring the influence of the effluents on coastal algae. Cultured marine phytoplankton were used in a number of experiments in which their growth response to various treatment plant effluents were compared. Although the effluents were matched in N and P concentrations, the growth results of various types of algae in different samples of effluent from one treatment plant did not correspond to predictions; different groups of algae and species within the groups also varied in growth response. It is concluded that ecological interpretation of results should not be based on cultures of only one or two species, an important consideration in studying the ecological effects of specific pollutants and in conducting toxicity bioassays or monitoring programs.

See: 24-0004, Benzidine

Stolzberg, Richard J. and Hume, David N.
RAPID FORMATION OF IMINODIACETATE FROM PHOTOCHEMICAL DEGRADATION OF FE(III) NITRILOTRIACETATE SOLUTIONS
Environ. Sci. Technol. 9 (7): 654-6 (1975)

Gas chromatographic analysis of the rapid photodegradation of dilute solutions of Fe (III)-nitrilotriacetate (NTA) in sunlight showed that iminodiacetate (IDA) was formed in essentially stoichiometric amounts. The IDA very slowly photodegraded to glycine under the same conditions. These results indicate that IDA may accumulate in a water system with a constant input of NTA. The potential carcinogenicity of N-nitroso iminodiacetic acid suggests, therefore, that this finding could be an environmental concern.

24-0025
TRICHLOROETHYLENE

Weber, Frank E.
TRICHLOROETHYLENE ALERT (Letter to Editor)
Chem. Eng. News 53 (26): 3 (June 30, 1975)

Contrary to impression given in recent article (See: CATS 21-0017), trichloroethylene is not used in most of the processing of spices. The FDA tolerance of 30 ppm (of trichloroethylene) to spices relates to the class of flavorings, the oleoresins.

24-0026
TRICHLOROETHYLENE

Anon
USE OF TRICHLOROETHYLENE FOR FOOD EXTRACTIONS IS UNDER ATTACK...
Chem. Eng. News 53 (27): 20 (July 7, 1975)

The recent National Cancer Institute report that trichloroethylene is carcinogenic in mice has raised a clamor to ban its use for food extractions. As an example, the Nader-affiliated Health Research Group has petitioned FDA to ban its use in decaffeinating coffee and in extracting oleoresin flavorants from spices.

On the other hand, General Foods Corp. claims that its Sanka and Brim coffees, decaffeinated with trichloroethylene, were not harmful to animals in several feeding studies. GF questions the validity of the NCI tests, claiming that an individual would have to drink some 50 million cups of decaffeinated coffee in his lifetime to ingest the amount of pure trichloroethylene used in the NCI mouse studies.

Anon
OIL SHALE DEVELOPMENT/SURFACE REHABILITATION
Environ Rept. 6 (4): 32 (June 30, 1975)

The various ecological factors (plant communities, animal communities, overburden and spoils, and geological stability) pertinent to land reclamation, following oil shale extraction, are covered in a 56-page publication from the Environmental Resources Center, Colorado State University, Ft. Collins, CO 80521. Title of the collected papers is, "Executive Summary: Surface Rehabilitation of Land Disturbances Resulting from Oil Shale Development."

24-0028
VINYL CHLORIDE

McGinty, Lawrence
PVC DUST FELLS FACTORY MICE SUGGESTING NEW WORK HAZARD
New Scientist: 714 (26 June 1975)

When guinea-pigs and rats were kept in dusty work areas of PVC factories, they developed pneumoconiosis, indicating that PVC powder is a potential health hazard to which an even larger number of workers are exposed than are exposed to VCM. This test, plus further tests that indicated PVC dust to be as biologically active as chrysotile asbestos were conducted in Italy, following a report of a new type of pneumoconiosis in a worker exposed to PVC dust for over one year.

In a separate study, researchers working on the biochemistry of asbestosis at University College Cardiff also found one of two samples of PVC dust to be as active in a haemolysis test as chrysotile asbestos. The fact that only one sample was active indicates that the activity may be related to a soluble surface-associated agent or that the samples may have come from different production processes that yielded different size particles.

24-0029
VINYL CHLORIDE

Anon
A HAZARD IN THIS PLASTIC WORLD
Chemistry 48 (7): 5 (July-August 1975)

The use of plastics has seemingly created a new fire hazard, which the Navy is now studying. When plastics containing chlorine, such as polyvinyl chloride, catch fire, hydrochloric acid gas is given off. This gas, which can be transported in smoke or in the water used to stop the fire, can cause fluid to develop in the lungs. It may be the cause of deaths occurring 48 to 72 hours after fire exposure.

24-0030
VINYL CHLORIDE

Ahlstrom, David H. et al
TRACE DETERMINATION OF VINYL CHLORIDE BY A CONCENTRATOR/GAS CHROMATOGRAPHY SYSTEM
Anal. Chem. 47 (8): 1411-12 (July 1975)

Thermal desorption of vinyl chloride monomer directly onto a chromatographic analytical column, after the monomer is adsorbed on activated charcoal, appears to be an accurate, reliable detection method. The technique, useful for both personnel and environmental monitoring, can also be fully automated.

24-0031
VINYL CHLORIDE

Anon
FDA CONSIDERING LIMITING THE VINYL CHLORIDE CONTENT OF FOOD PACKAGING MATERIALS...
Chem. Eng. News 53 (27): 8 (July 7, 1975)

FDA may limit the VCM content of food packaging materials now that its bureau of foods is recommending a 50-ppb-maximum level for VCM residues in PVC packaging for foods. VCM reputedly migrates from the packages and, should it be found to be carcinogenic when ingested, PVC may be banned from contact with food.

24-0032
VINYL CHLORIDE

Bolt, H.M. et al
METABOLISM OF VINYL CHLORIDE (Letter to Editor)
Lancet 1, 7922): 1425 (June 28, 1975)

Although vinyl chloride was not mutagenic, studies in bacterial test systems showed that liver microsomes with N.A.D.P.H. (reduced form of nicotinamide-adenine-dinucleotide-phosphate) as co-factor metabolize VC to mutagenic metabolites. These results were obtained with both animal and human liver. Additional studies are necessary to determine the possible relationship of VC and the covalent binding of its metabolites in the liver.

VINYL CHLORIDE

See: 24-0006, Brominated biphenyls

See also: 24-0041, General Information

Bartsch, Helmut et al
TISSUE-MEDIATED MUTAGENICITY OF VINYLIDENE CHLORIDE AND 2-CHLOROBUTADIENE IN *SALMONELLA TYPHIMURIUM*
Nature 255 (5510): 641-3 (June 19, 1975)

Reported tests indicate that vinylidene chloride exerts a mutagenic effect on *S. typhimurium* exposed to concentrations of 0.2, 2 or 20% of the compound in air. Mutagenic effects were also reported for 2-chlorobutadiene in air.

The authors suggest an epidemiological survey of workers exposed to these chemicals.

24-0034
GENERAL INFORMATION

Anon
ENVIRONMENTAL GROUPS CALL FOR LIMITING USE OF PCB
Chem. Wk. 116 (26): 43 (June 25, 1975)

The Lake Michigan Toxic Substances Committee (LMTSC), an interstate advisory group to EPA, is recommending limited use of PCB's but cannot offer an alternative for transformers and capacitors. PCB's are made in U.S. only by Monsanto, and that company sells them only for insulating fluids or hermetically sealed devices. Apparently, however, some imported PCB's are being used for coatings hydraulic fluids for mining equipment and for wax process castings. The LMTSC is concerned about the high level of PCB still found in lake fish. As a result of this, the Michigan Natural Resources Council wants a complete ban on PCB, which utility sources are fighting because no substitute materials have equivalent coating, heat-transfer and fire-resistance properties. One hope: Dow is now promoting polydimethyl siloxane for use as a transformer fluid.

24-0035
GENERAL INFORMATION

Holmström, Arne
PLASTIC FILMS ON THE BOTTOM OF THE SKAGERACK
Nature 255 (5510): 622-3 (June 19, 1975)

Swedish fishermen are finding sheets of plastic [low density polyethylene (LDPE)] in their trawling nets. These sheets are brittle, indicating typical degradation of LDPE, and are covered with biological material. The 3-4 months growth of this material may explain why the plastic has sunk to great depths rather than remaining afloat.

24-0036
GENERAL INFORMATION

Anon
PHOSPHATE REPLACEMENT UNVEILED BY MONSANTO
Chem. Wk. 117 (1): 9 (July 2, 1975)

A new detergent builder, Builder M, developed by Monsanto as an alternate to phosphate, which is banned in some areas, will be offered to laundry detergent makers. Monsanto's Dayton, Ohio, pilot plant can produce tonnage quantities. Commercial production of the product, which contains trisodium 2-oxa, 1,1,3,-propane tricarboxylate, is scheduled for the late 1970's, providing that it meets performance, safety, and environmental standards. Monsanto is aiming for about 10% of total U.S. laundry detergent builders' market.

24-0037
GENERAL INFORMATION

Anon
MCA PRICES TOXIC SUBSTANCES CONTROL
Chem. Eng. News 53 (26): 5 (June 30, 1975)

Chemical industry compliance with the Toxic Substances Control Act, S. 776, could cost the industry $358 million to over $1.3 billion, according to an economic impact analysis conducted by Foster D. Snell, Inc. for the MCA. The report uses four models to show the economic impact under varying degrees of EPA enforcement. Under the least enforcement model, no inflationary impact is anticipated, but the strict enforcement model indicates an inflationary impact of 0.5%, or $12 billion in 1985 dollars.

24-0038
GENERAL INFORMATION

Gotzsche, Anne-Lise
FLUORIDATION (Letter to Editor)
New Scientist 66 (955): 725 (June 26, 1975)

Refuting criticism of her book, The Fluoride Question, published by Davis-Poynter in 1975, the author points out that Norway and Sweden have abandoned fluoridation, and that Dutch doctors and dentists report that it causes disturbances in cholinesterase levels in the blood of humans and thalidomide-type deformities in chickens.

24-0039
GENERAL INFORMATION

Murphy, James C. et al
EVALUATION OF THE TERATOGENIC POTENTIAL OF A SPRAY ADHESIVE IN HAMSTERS
Teratology 11 (3): 243-6 (June 1975)

3-M's spray adhesive, "Foil Art Adhesive," was tested for its potential teratogenic effects on pregnant Syrian hamsters. Approximate composition of the product is 14% butadiene-styrene rubber with a resin derivative and 86% petroleum hydrocarbon solvent or propellant.

On days 5-10 of gestation, the hamsters were exposed twice daily for 30 minutes to 8.0 ± 0.13, 11.6 ± 0.11, or 13.23 ± 0.49 g of spray in a 100-l static inhalation chamber. Maternal alopecia developed by 4 days in all animals inhaling the highest dose level and in 17 of 20 at the next highest exposure. One death occurred at the highest exposure level. Fetal growth was retarded at all dose levels, but there were no malformations and no adverse effects on fetal survival. It was concluded that at the test dose levels, the spray, although toxic, was not teratogenic.

24-0040
GENERAL INFORMATION

Labianca, Domenick A.
METHANOL POISONING. BIOCHEMICAL CONSIDERATIONS
Chemistry 48 (7): 19-20 (July-August 1975)

Methanol widely used as a solvent and in the synthesis of other chemicals is still used in many patent medicines although its poisoning potential was recognized in the mid-1800's. This brief review cites some poisoning cases, discusses the toxic metabolites, and offers several methods for treating methanol poisoning.

24-0041
GENERAL INFORMATION

Husovsky, A.A.
OSHA REGULATIONS CHALLENGE ANALYTICAL CHEMISTRY
Anal. Chem. 47 (8): 773A (July 1975)

This editorial comment points out that OSHA standards for permitted levels of asbestos, vinyl chloride, and other chemicals do not take into consideration standard deviation or experimental error. Numbers in the standards are absolute numbers.

24-0042
GENERAL INFORMATION

Anon
NADER SEEKS EPA STUDY OF NO_2/CANCER LINK
Air/Water Pollut. Rept. 13 (26): 255 (June 30, 1975)

The EPA has been asked by Ralph Nader and Samuel Epstein of Case Western Reserve University to study nitrosamines formed in the air or in the body to determine if they may be the link between ambient NO_2 and cancer deaths. Recent studies seem to indicate ambient nitrogen dioxide levels in urban areas may be related to cancer death rates.

24-0043
GENERAL INFORMATION

Anon
MORE TESTS FOR VACOR
Chem. Wk. 117 (2): 17 (July 9, 1975)

Vacor, the new rodenticide from Rohn and Haas (See: CATS 17-0040) may be toxic to humans when ingested, according to evidence from an unidentified foreign country. The company plans additional studies and will put a warning label on its product.

24-0044
GENERAL INFORMATION

Anon
THE POSSIBILITY THAT DUSTS OF CERTAIN CHROMATE PIGMENTS. . .
Chem. Eng. News 53 (27): 20 (July 7, 1975)

Following reports from Europe on lead chromate, lead-molybdenum chromate, and zinc chromate pigments, the Dry Color Manufacturers' Association is advising pigment manufacturers and users that dusts of certain chromate pigments are potential carcinogens. The association is currently sponsoring an epidemiological study by Tabershaw-Cooper Associates and some animal studies by Bio-Test Laboratories.

24-0045
GENERAL INFORMATION

Cottis, S.G.
AROMATIC POLYESTER PLASTICS
Mod. Plast. 52 (7): 62-3 (1975)

Now available commercially is a series of aromatic polyester resins offering a combination of good mechanical, electrical, wear, and high-temperature properties. Properties vary with the composition of the copolyesters. Wear resistance of PTFE bearing compositions is greatly improved via the use of the p-oxybenzoyl homopolyester used at a concentration of 25%.

24-0046
GENERAL INFORMATION

Anon
SLUDGE/NEW YORK BIGHT
Environ. Rept. 6 (4): 27 (June 30, 1975)

Although waste material dumped into the New York Bight seems to be causing no immediate hazards, a recent study suggests that the marine ecosystem is being harmed. Dumping should be transferred to another site or another disposal method should be sought, according to, "Ocean Dumping in the New York Bight," Report 321-MESA 2, from Environmental Research Laboratories, NOAA, Boulder, CO 80302. Among the findings reported are increased concentrations of bacteria in shellfish, fin rot in fish, and the presence of antibiotic-resistant strains of coliform bacteria.

24-0047
GENERAL INFORMATION

Anon
POWER PLANTS/FISH KILLS
Environ. Rept. 6 (4): 29 (June 30, 1975)

Immediate kills or "slow death" of menhaden, an important commercial fish, from coastal power plant effluents are reported by the National Oceanic and Atmospheric Administration (MFR Paper 1094 from D83, Tech. Info. Div., Environment Science Information Center, NOAA, Wash., D.C. 20235).

Menhaden are very susceptible to water temperature changes. If discharge pipes were extended a greater distance from shore, if effluent were discharged via high velocity jets into the water to minimize temperature variations, or if special condensers were used to limit the temperature rise in the cooling water, the fish kills could be prevented.

24-0048
GENERAL INFORMATION

Anon
XYLENE EXPOSURE CRITERIA
Environ. Rept. 6 (4): 29 (June 30, 1975)

NIOSH's "Criteria for a Recommended Standard, Occupational Exposure to Xylene," suggests new health and safety criteria for some 140,000 U.S. chemical and petroleum workers potentially exposed to the widely-used industrial solvent and additive.

Long suspect as toxic to blood and blood-forming agents (but probably because of benzene contamination), xylene acts as a narcotic on workers, causing muscular weakness, incoordination, and mental confusion.

24-0049
GENERAL INFORMATION

Anon
RODENTICIDE BLAMED FOR KOREAN DEATHS
Chem. Eng. News 53 (28): 8 (July 14, 1975)

Vacor, the new one-dose rodenticide from Rohm and Haas, apparently caused seven deaths in South Korea, presumably from misuse of the product. Also, N-3-pyridylmethyl-N'-p-nitrophenyl urea, the active ingredient in Vacor made a Korean chemist ill, when he ate a small amount while testing its effects.

Anon
COMPANIES STEP UP TOXIC SUBSTANCES TESTING PACE
Chem. Wk. 117 (4): 33 (July 23, 1975)

Acrylonitrile, vinylidene chloride, vinyl chloride, 2,4,5-T and other compounds are being tested for their toxic, carcinogenic and mutagenic effects on animals and bacteria in a stepped-up research program by Dow, Union Carbide, Stauffer and other chemical companies. Expanded facilities, additional research personnel, and more sophisticated testing techniques will, hopefully, provide more reliable information on the concentrations of toxic compounds that threaten living organisms; the conditions under which materials are hazardous; the changes that airborne substances undergo, after they enter the body, etc.

In another move, presumably to organize and direct the research, 11 chemical companies have set up the Chemical Industry Institute of Toxicology (C.I.I.T.), which is now establishing a list of chemicals to be tested.

ACRYLONITRILE

See also: 25-0031, Vinyl Chloride

25-0002
ARSENIC

Fennelly, Paul F.
PRIMARY AND SECONDARY PARTICULATES AS POLLUTANTS
A LITERATURE REVIEW
JAPCA 25 (7): 697-704 (1975)

This review of the literature, from 1950-1974, on primary particulates (ranging in size from 0.005 to 500 μm) and secondary particulates (0.01 to 1.0 μm) covers their size distribution, origin, and their effect on health and esthetics.

As yet, there is no good summary of the chemical composition and size distribution of particles from potential sources of primary particulates; information is also lacking on the chemical composition of particulate matter as a function of size. Studies reported in 1973 and 1974 on the chemical composition of fly ash as a function of particle size indicate that arsenic and other toxic elements (e.g., Pb, Mn, Cd, Tl, Cr, Ni, and S) increase noticeably in concentration with decreasing particle size.

25-0003
ARSENIC

Fordyce, J. Stuart and Sheibley, Dean W.
ESTIMATE OF CONTRIBUTION OF JET AIRCRAFT OPERATIONS TO TRACE ELEMENT
CONCENTRATION AT OR NEAR AIRPORTS
JAPCA 25 (7): 721-4 (1975)

Neutron activation analyses of ASTM type A jet fuel detected 48 trace elements in the fuel. The concentrations (ppm by wt) of these elements in the various samples tested are tabulated. Only ten, aluminum, gold, indium, lanthanum, titanium, vanadium, barium, dysprosium, tellurium, and uranium were found above the detection limits encountered. Concentrations greater than 0.1 ppm were noted for aluminum, titanium, and barium. Arsenic, antimony, cadmium, and vanadium are a few of the other trace elements discovered. Exhaust gas concentrations were estimated. An ambient contribution at or near airports, calculated from the Los Angeles International Airport dispersion model, showed the ambient contribution to be about an order of magnitude below typical urban levels for most of the elements.

25-0004
ARSENIC

Gelman, C. and Marshall, J.C.
HIGH PURITY FIBROUS AIR SAMPLING MEDIA
Amer.Ind. Hyg. Assoc. J. 36 (7): 512-7 (1975)

The failure of the commonly-used glass fiber media to measure with sufficient accuracy the low concentrations of metal levels in suspended particulate matter prompted Gelman Instrument Co. to seek alternate fibrous materials for high purity, low background filters. An improved glass fiber filter, using quartz fiber, which was developed by Arthur D. Little, Inc. to meet recent EPA specifications, was considered too expensive. Further tests with quartz fiber and Spectro Grade glass fiber resulted in the development of a Spectro Grade glass fiber sheet coated with an organic silicone resin (to reduce SO_2 pickup), which is reported to give satisfactory results. Arsenic and antimony are among the elements for which maximum allowable concentrations per filter are listed.

25-0005
ARSENIC

Anon
THE NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY. . .
Chem. Eng. News 53 (29): 8 (July 21, 1975)

A revised NIOSH criteria document on inorganic arsenic recommends that the maximum worker exposure limit (as a time-weighted average for a 10-hr day) be lowered from 0.05 mg to 0.002 mg/cu m air.

25-0006
ARSENIC

Anon
GETTING HEALTH UNDER WRAPS
Chem. Wk. 117 (4): 27 (July 23, 1975)

Chemical companies are developing computerized systems to aid in determining the potential hazards of chemicals to which workers are exposed. Dow will spend $100,000 over two years to expand its systemization program that was started in 1968, which helped in determining the arsenic exposure-respiratory cancer link disclosed in 1974. Du Pont, Exxon, Eastman Kodak are among other companies using computer-based files for health data.

25-0007
ARSENIC

Bettley, F. Ray and O'Shea, J.A.
THE ABSORPTION OF ARSENIC AND ITS RELATION TO CARCINOMA
Brit. J. Dermatology 92 (5): 563-8 (1975)

In an attempt to determine why ingested arsenic causes cancer in some individuals and not in others, four patients with arsenical cancers were given a test dose of arsenic. In general, in these patients blood levels were lower and total urinary excretion was less than in normal controls, who had been given arsenic for the first time. Fecal excretion results were inconclusive and there were no significant differences in the arsenic content of the hair of both groups. Apparently, in the cancer patients there was increased storage of arsenic, probably due to more rapid or greater removal of absorbed arsenic from the blood stream to storage tissues. It may be that abnormally high retention of arsenic is an individual metabolic trait, an important consideration from an environmental viewpoint as well as a medicinal viewpoint. As an example, agricultural workers, who may not even directly handle arsenical pesticides, may be inadvertently exposed to arsenic.

See also: 25-0031, Vinyl chloride

See also: 25-0035, Vinyl chloride

*25-0008
ASBESTOS

Doniach, I. et al
PREVALENCE OF ASBESTOS BODIES IN A NECROPSY SERIES IN EAST LONDON: ASSOCIATION WITH DISEASE, OCCUPATION, AND DOMICILIARY ADDRESS
Brit. J. Ind. Med. 32 (1): 16-30 (Feb. 1975)

In an examination of the lung sections of 216 men and 178 women, asbestos bodies were found in 42% of the men and in 30% of the women. Although the number of bodies in the positive cases was small compared to the numbers seen typically in asbestosis, an increased number of asbestos body positives was found in males with stomach cancer and in females with breast cancer.

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*25-0009
ASBESTOS

Gabor, Silvia and Anca, Zoe
EFFECT OF ASBESTOS ON LIPID PEROXIDATION IN THE RED CELLS
Brit. J. Ind. Med. 32 (1): 39-41 (Feb. 1975)

Different types of asbestos dust reacted differently on the lipid peroxidation of erythrocytes, the largest amounts of lipid peroxides being developed by chrysotiles. The study indicates that lipid peroxidation of unsaturated fatty acids may be a factor in the membrane-damaging effects of asbestos dust.

Horvitz, J.S.
ASBESTOS AND ITS ENVIRONMENTAL IMPACT
Environ. Affairs 3 (1): 145-65 (1974)

This review of the effects of asbestos on public health from various sources of exposure (air, water, food, drinks, drugs) and the legal and regulatory promulgations (e.g., the Occupational Safety and Health Act and the Clean Air Act) established to curb its hazardous effects suggest the need for stricter laws and regulations.

25-0011
BROMINATED BIPHENYLS

Zerkel Fred.H.
REVAMPING OF CHEMICAL CONTROLS URGED
Chem. Eng. News 53 (29): 13-14 (July 21, 1975)

As a result of a study, commissioned by EPA, the National Academy of Sciences has published its "Decision Making for Regulating Chemicals in the Environment" study. In general, the study recommends that the government should change its methods of regulating chemicals.

Those advocating a new use of a chemical or its continued use, after the government shows that it could be a health or environmental hazard, should bear the burden of proving the chemical's benefits or safety. Congress should offer statutory guidance on the pertinent factors involved in regulating chemicals and should review adversary procedures to shorten the decision making process.

Among case studies reviewed in this study (but not included in the report) are EPA's decision to establish residue tolerances for hexachlorobenzene, and industry's decision not to sell polybrominated biphenyls for certain uses.

25-0012
BROMINATED BIPHENYLS

Norris, J.M. et al
EVALUATION OF DECABROMODIPHENYL OXIDE AS A FLAME-RETARDANT CHEMICAL
pp. 100-16 in Chemicals, Human Health and the Environment. A Collection of Dow Scientific Papers. Vol. I Dow Chemical Co., Midland, Mich. 1975. [Also in: JFF/Combustion Toxicol. 1: 52+ (Feb. 1974)

Criteria for acceptable flame retardants for synthetic polymers used for various purposes are outlined. Discussed here are the chemical/physical properties and the results of toxicology studies and environmental studies conducted on two candidate flame retardants: decabromodiphenyl oxide (DBDPO) and octabromobiphenyl (OBBP). Environmental data on DBDPO and OBBP are compared with data on polychlorinated biphenyls.

The results indicate that OBBP may accumulate in the environment as do PCB's. Although additional research will be conducted on DBDPO, data to-date indicate that the compound is an environmentally and toxicologically safe flame retardant for thermoplastics.

*25-0013
FLUOROCARBONS

Howard, Philip H. and Hanchett, Arnold
CHLOROFLUOROCARBON SOURCES OF ENVIRONMENTAL CONTAMINATION
Science 189 (4198): 217-9 (18 July 1975)

On the basis of total U.S. production of five chlorofluorocarbons (FCC's) and the amounts of these FCC's used in various applications, estimates of their environmental release were calculated. Although large quantities of FCC's already produced have not yet reached the environment, it is concluded that regulation of U.S. applications would not be enough to stop the potential ozone destruction in the stratosphere, but would merely help to reduce it.

*25-0014
FLUOROCARBONS

Hester, Norman E. et al
FLUOROCARBON AIR POLLUTANTS II
Atmos. Environ. 9 (6/7): 603-6 (June/July 1975)

Modifications in analytical instruments and techniques have permitted more accurate measurement of fluorocarbons in the atmosphere. Both F-11 and F-12 can be measured routinely at concentrations far below typical levels of background unpolluted air. Fluorocarbon irradiation studies under simulated smog and other test conditions indicated that fluorocarbons 11, 12, 113, and 114 are photochemically stable. As tracers of the movements of air masses, the fluorocarbons (F-11 and F-12) proved effective.

*25-0015
FLUOROCARBONS

Taylor, George J.
CARDIAC ARRHYTHMIAS IN HYPOXIC RABBITS DURING AEROSOL PROPELLANT INHALATION
Arch. Environ. Health 30 (7): 349-52 (1975)

Earlier studies on the induction of cardiac arrhythmias in mice caused by the interactions of fluorocarbons and hypoxia yielded conflicting results. In this study, conscious rabbits were exposed for four minutes to combinations of varying degrees of hypoxia and different concentrations of fluorocarbon-11. Nine combinations of 21%, 11%, or 7% oxygen and 0%, 5%, or 15% F-11 were tested. No cardiac arrythmias or death occurred in rabbits exposed to 7% oxygen, but severe bradyarrythmias developed in all animals exposed to the 15% F-11 and 7% oxygen combination; three of the four rabbits in this group died. These and other results indicate that hypoxia and fluorocarbons interact to cause changes in cardiac rhythm and even death.

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*25-0016
FLUOROCARBONS

Flowers, Nancy C. et al
CONCENTRATIONS OF FLUOROALKANES ASSOCIATED WITH CARDIAC CONDUCTION SYSTEM TOXICITY
Arch. Environ. Health 30 (7): 353-60 (1975)

Dogs were used in this experiment to determine the specific concentration of Freons 11 and 12 that would affect the cardiac conduction system. Data were sought on 1) the highest concentration causing no detectable changes, 2) the concentration ranges causing detectable but reversible changes, and 3) the lowest concentration causing death, all during 10-minute exposure periods. These concentrations were also to be correlated with concentrations existing in beauty shops using large amounts of aerosol sprays. At concentrations of Freon-11 under 15% no detectable changes in cardiac rate and no deaths occurred. From 15% to 17.8%, 50% of the animals developed sinus bradycardia associated with reversibility and survival. Between 15% and 17%, seven animals died and nine survived. All animals died during 10-minute exposures to concentrations above 21%. For Freon 12, concentrations in excess of 95% were required to cause death during the 10-minute exposure period. Compared to the exposure of 21.5% Freon-11 (215,000 ppm), peak samples in a beauty shop did not exceed 310 ppm.

Taylor, George J. and Drew, Robert T.
CARDIOMYOPATHY PREDISPOSES HAMSTERS TO TRICHLOROFLUOROMETHANE TOXICITY
Toxicol. Appl. Pharmacol. 32 (1): 177-83 (April 1975)

Certain hamsters, because of a biochemical and genetic defect, develop cardiac hypertrophy and die between 240-270 days of age from congestive heart failure. These animals are more susceptible to trichlorofluoromethane toxicity, according to results reported in this study, than are random-bred hamsters.

Fisbein, L.
MUTAGENS AND POTENTIAL MUTAGENS IN THE BIOSPHERE. I. DDT AND ITS METABOLITES, POLYCHLORINATED BIPHENYLS, CHLORODIOXINS, POLYCYCLIC AROMATIC HYDROCARBONS, HALOETHERS.
Sci. Total Environ. 2 (4): 305-40 (July 1974)

To assess the hazards to man from the many toxic and potentially mutagenic chemicals existing in the environment or added to it from our ever-expanding production of chemicals, this review attempts to present comparative data on the amounts and residues in the environment of a small number of mutagenic or potentially mutagenic compounds. Discussed are DDT and its metabolites, polychlorinated biphenyls, chlorodioxins, polycyclic aromatic hydrocarbons, and haloethers with emphasis on their occurrence, use, distributions, environmental transport, bioconcentration and bioaccumulation. Data derived from 148 references show gaps in information on patterns of regional and local variation of toxic substances, pathways of residues within the trophic networks, and the physiological and ecological effects of sub-lethal levels of various toxicants.

Moolenaar, Robert J.
ENVIRONMENTAL IMPACT OF CHEMICALS
pp.2-6 in Chemicals, Human Health and the Environment. A Collection of Dow Scientific Papers. Vol. I. Dow Chemical Co., Midland, Michigan. 1975.

The stability, movement, bioconcentration, and toxicity of chemicals are key parameters in assessing their environmental impact. To illustrate this conclusion, the author compares various properties of perchloroethylene, hexachlorobenzene, and propylene glycol.

HEXACHLOROBENZENE

See: 25-0011, Brominated Biphenyls

See also: 25-0037, General Information

25-0020
ISOCYANATES

Zwolinski, L.M.
BLOWING AGENTS FOR POLYURETHANES
Rubber Age 107 (7): 50-5 (1975)

In this discussion of the functions and types of blowing agents used in making urethane foams, the author includes a brief discussion of urethane chemistry, including the reactions of isocyanates with polyols, amines, and water.

25-0021
ISOCYANATES

Adams, W.G.F.
LONG-TERM EFFECTS ON THE HEALTH OF MEN ENGAGED IN THE MANUFACTURE OF TOLYLENE DI-ISOCYANATE
Brit. J. Ind. Med. 32 (1): 72-8 (Feb. 1975)

This nine-year study of workers manufacturing tolylene diisocyanate (TDI) covered workers who showed no respiratory symptoms as well as those who complained of respiratory problems. From a total of 565 men employed for some period between 1961 to 1972, the majority (14.8%) who left because of respiratory problems did so in their first year of employment; in the second and later years only 1 to 3.5% of those still working developed symptoms. Data collected in a questionnaire from the Medical Research Council showed no significant difference between 76 TDI workers and 76 non-TDI-exposed controls. Annual lung function tests on 186 asymptomatic men with possible exposure to TDI showed results not significantly different from those of non-exposed men, indicating a drop in ventilatory capacity does not necessarily follow exposure to low concentration of TDI. Forty-six men, who left the plant because of respiratory problems and had no further contact with TDI, suffered more respiratory problems than controls at the 1% level of significance, indicating that long-term effects can result after the development of acute symptoms. A similar result was noted in the reduced lung function of 61 men who had left the plant, indicating that persistent symptoms occur in men in whom sensitization has occurred.

25-0022
MODEL ECOSYSTEMS

Saunders, P.T. and Bazin, M.J.
STABILITY OF COMPLEX ECOSYSTEMS
Nature 256 (5513): 120-1 (July 10, 1975)

Random matrices were constructed to determine if increased complexity in an ecosystem near a stable steady state will tend to increase or decrease the rate at which perturbations die out.

25-0023
MODEL ECOSYSTEMS

Foster, P.
TRACE METALS IN BROWN ALGAE, A COMPARISON OF TWO ANALYTICAL METHODS
Chemosphere 4 (3): 151-4 (June 1975)

Atomic absorption spectrophotometry and X-ray fluorescence were used to determine the concentrations of iron, manganese, copper, and zinc in marine algae. Because marine algae can concentrate metals and integrate their water concentrations over long periods of time, they have been considered as possible pollution indices in coastal waters.

25-0024
MODEL ECOSYSTEMS

Young, James S.
MENHADEN AND POWER PLANTS --A GROWING CONCERN
Marine Fisheries Rev. 36 (10): 19-23 (1974)

Atlantic menhaden, which help support the largest U.S. commercial fishery, are used to provide fish meal for poultry, feed for livestock and oil for paints, inks, and sealants. Yet, these important fish are very vulnerable to hazards generated by power plants - menhaden kills having been attributed to heat shock, cold shock, impingements on intake screens, gas embolisms, biocides, and entrainment.

The author suggests the need for a full understanding of the physical, chemical, and biological effects of the ecosystem as a prerequisite in the siting of electric generating plants along coastal zones.

25-0025
MODEL ECOSYSTEMS

Anon
AQUATIC ECOSYSTEMS
Environ. Rept. 6 (5): 40 (July 14, 1975)

A technique for developing the capability to model aquatic ecosystems, or subsystems, is described in the brochure, "Modeling Dynamics of Biological Components of Aquatic Ecosystems," available free from the National Environmental Research Center, Office of Research and Development, U.S. EPA, Corvallis, OR 97330

Schwetz, B.A. et al
THE EFFECT OF MATERNALLY INHALED TRICHLOROETHYLENE, PERCHLOROETHYLENE, METHYL CHLOROFROM, AND METHYLENE CHLORIDE ON EMBRYONAL AND FETAL DEVELOPMENT IN MICE AND RATS
Toxicol. Appl. Pharmacol. 32 (1): 84-96 (1975)

Mice and rats on days 6-15 of gestation were exposed to trichloroethylene, perchloroethylene, methyl chloroform, and methylene chloride at a concentration twice that of the maximum allowable limit for human exposure in industry (per 1973 ACGIH standards of 300, 300, 875, and 1250 ppm, respectively).

No significant maternal, embryonal, or fetal toxicity and no teratogenic effects were observed in either the rats or mice exposed to any of the four solvents. Methylene chloride caused an elevation in carboxyhemoglobin content of both species.

PERCHLOROETHYLENE

See: 25-0019, Hexachlorobenzene

*25-0027
PHTHALATES

Lake, B.G. et al
STUDIES ON THE HEPATIC EFFECTS OF ORALLY ADMINISTERED DI-(2-ETHYLHEXYL) PHTHALATE IN THE RAT
Toxicol. Appl. Pharmacol. 32 (2): 355-67 (May 1975)

Rats given 2000 mg/kg of di-(2-ethylhexyl) phthalate (DEHP) daily for 21 days (oral intubation) showed increased liver weights, increased alcohol dehydrogenase activity, decreased microsomal glucose-6-phosphatase activity, and other hepatic effects. There was no apparent storage of phthalate residues in the liver.

Apparently, the metabolic degradation of DEHP to the monoester (MEHP) is the determining step in the changes resulting from DEHP in the rat.

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*25-0028
PHTHALATES

Mathur, S.P.
RESPIROMETRIC EVIDENCE OF THE UTILIZATION OF DI-OCTYL AND DI-2-ETHYLHEXYL PHTHALATE PLASTICIZERS
J. Environ. Quality 3 (3): 207-9 (July-Sept. 1974)

Soil respiration rates were measured 14 weeks after incubation of a loam soil at varying temperatures (4°C - 32°C) with dioctyl phthalate (DOP), di-2-ethylhexyl phthalate (DEHP), and two other phthalic acid esters (PAEs). Microbial utilization of all PAEs was indicated via increased rates of respiration. Marginal use of DOP and DEHP was indicated at 4°C and 10°C.

[Abstr. in: Pollution Abstrs. 6 (1): 132 (1975)]

See: 25-0026, Perchloroethylene

25-0029
SHALE OIL EXTRACTION AND REFINING

Pfeffer, F.M.
POLLUTIONAL PROBLEMS AND RESEARCH NEEDS FOR AN OIL SHALE INDUSTRY
U.S. EPA Office of Res. and Devl. ENVIRONMENTAL PROTECTION TECHNOLOGY
SERIES EPA-660/2-74-067, June 1974. 41pp.

Because stabilization of spent shale residues resulting from recovery of fuels from oil shale poses a big environmental problem, this report describes the physical and leaching properties of the shale residues left by the above-ground retorting processes of the Bureau of Mines, Union Oil Co., and Oil Shale Corp. Also discussed are the oil shale resources and surface stream drainage of the Green River Formation of Colorado, Utah, and Wyoming. Attention is also given to such topics as the process and waste waters, recovery of minerals, radioactive contamination of groundwater, and particular areas of essential research.

25-0030
SHALE OIL EXTRACTION AND REFINING

Schmidt-Collerus, J.J.
THE DISPOSAL AND ENVIRONMENTAL EFFECTS OF CARBONACEOUS SOLID WASTES FROM COMMERCIAL OIL SHALE OPERATIONS
PB-231 796/4GA

Oil shale retorting gives rise to such byproducts as solid spent shale, process water, and process gases. Because of the potential impact on ecology of chronic exposure to inorganic and organic carcinogens present in trace amounts, the potential impact of the trace organic matter from carbonaceous spent shale was studied. A comparison was made of the polycyclic organic content of soil, water, air, and vegetation in areas where oil shale operations might take place and the polycondensed aromatics found in carbonaceous spent shale from pilot plant retorting processes.

25-0031
VINYL CHLORIDE

Ott, Marvin Gerald et al
VINYL CHLORIDE EXPOSURE IN A CONTROLLED INDUSTRIAL ENVIRONMENT
A LONG-TERM MORTALITY EXPERIENCE IN 594 EMPLOYEES
Arch. Environ. Health 30 (7): 333-9 (1975)

A summary of the mortality experience of workers exposed to vinyl chloride, to lesser amounts of vinylidene chloride, and to other chemicals, e.g., arsenic, methyl methacrylate, acrylonitrile, and methacrylonitrile, shows no deaths due to angiosarcomas or any liver malignancy. On the other hand, total deaths from malignancies in the high-exposure groups exceeded those expected. No adverse malignancy effects were found in the lower-exposure categories.

25-0032
VINYL CHLORIDE

Confer, Robert G.
A UV-CONDUCTIVITY METHOD FOR DETERMINATION OF AIRBORNE LEVELS OF VINYL CHLORIDE
Am. Ind. Hyg. Assoc. J. 36 (7): 491-6 (1975)

Described is a method for measuring vinyl chloride based on the measurement of the conductivity in deionized water of the decomposition products of VC-chlorine, hydrogen chloride, phosgene, and other products -- formed when VC is exposed to flame or UV light.

Judging from the rapid decomposition of vinyl chloride by UV light, it is suggested that UV radiation might be used to control VC release from stacks and other potential release points in plants where VC or PVC are manufactured. Assuming that sunlight will quickly decompose VC, ambient levels of the compound could be higher on cloudy days or at night.

25-0033
VINYL CHLORIDE

Hefner, R.E., Jr., et al
THE FATE OF INHALED VCM IN RATS
pp.44-54 in Chemicals, Human Health and the Environment. A Collection of Dow Scientific Papers. Vol. I. Dow Chemical Co., Midland, Mich. 1975. [Also in: Annals of N.Y. Acad. Sci. 246: 135-48 (Jan. 1975)

Because of lack of information on the fate of VCM in the mammalian organism, studies were made on rats exposed to varying concentrations (51 up to 15,000 ppm) of VCM. Among the preliminary results: rats exposed to less than 100 ppm metabolized VCM readily; in rats exposed to more than 220 ppm, the rate of metabolism was reduced; the urine of rats exposed to 5000 ppm VCM daily for 9 weeks contained monochloroacetic acid; exposure to VCM reduces the nonprotein sulfhydryl concentration of liver.

25-0034
VINYL CHLORIDE

Cook, R.R.
MEDICAL SURVEILLANCE OF VINYL CHLORIDE WORKERS
pp. 86-9 in Chemicals, Human Health and the Environment. A Collection of Dow Scientific Papers Vol. I. Dow Chemical Co., Midland, Mich.,(1975)

Brief review of Dow's selected surveillance data on 335 workers exposed to vinyl chloride, which showed that exposures below 200 ppm resulted in no effects of statistical significance.

Holder, B.B.
MORTALITY STUDIES OF VINYL CHLORIDE WORKERS
pp. 90-8 in Chemicals, Human Health and the Environment. A Collection of Dow Scientific Papers. Vol. I. Dow Chemical Co., Midland, Mich., (1975)

A study of the long-term mortality experience of 594 workers exposed to vinyl chloride in a controlled industrial environment between 1942 and 1960 indicated that in those exposed to over 200 ppm there was an apparent increase in overall malignancy rate. Other statistics are tabulated for workers exposed to VC and also for workers exposed to arsenic as well as to VC.

VINYL CHLORIDE

See: 25-0001, Acrylonitrile

See: 25-0001, Acrylonitrile

See: 25-0031, Vinyl chloride

Anon
EDB DRAWS NIOSH ALERT
Chem. Wk. 117 (4): 14 (July 23, 1975)

Ethylene dibromide (EDB) fed to rats and mice is carcinogenic, according to NIOSH, causing squamous cell cancer of the stomach. Although there is no evidence of EDB's causing cancer in humans, NCI is conducting inhalation studies on animals; man is usually exposed to EDB (which is chiefly used as an automobile gasoline additive) by inhalation.

Major producers of EDB (Ethyl Corp, Dow Chemical, Great Lakes Chemical and Houston Chemical) are questioning NCI's findings.

According to NIOSH, 9,000 U.S. workers are exposed to EDB; a few hundred work in production plants or compound EDB into leaded gasoline. Current exposure limits are 20 ppm.

25-0037
GENERAL INFORMATION

Anon
PESTICIDES ACCUSED
Chem. Wk. 117 (3): 19 (July 16, 1975)

Endrin and other pesticides may have caused the recent deaths of 400 brown pelicans in Louisiana. Varying amounts of several pesticides were found in brain tissue of dead birds. An undisclosed amount of hexachlorobenzene was also found.

25-0038
GENERAL INFORMATION

Ames, Bruce N. et al
HAIR DYES ARE MUTAGENIC: IDENTIFICATION OF A VARIETY OF MUTAGENIC INGREDIENTS
Proc. Nat. Acad. Sci. U.S.A. 72 (6): 2423-7 (1975)

One hundred and fifty out of 169 (89%) of commercial oxidative-type (hydrogen peroxide) hair dyes were mutagenic, according to the sensitive, simple bacterial test used. Nine of the 18 components of the dyes tested, plus 2,4-diaminotoluene (previously used in hair dyes) were mutagenic in varying degrees. Three dye components, p-phenylenediamine, 2,5-diaminotoluene, and 2,5-diaminoanisole, showed a marked increase in mutagenicity, when mixed with hydrogen peroxide. The oxidative-type hair dyes comprise about 75% of the $250 million/year hair dye market, which can serve as an indication of their potential hazard if the tested compounds prove to be carcinogenic or mutagenic in humans.

25-0039
GENERAL INFORMATION

Kerfoot, Edward J. and Mooney, Thomas F., Jr.
FORMALDEHYDE AND PARAFORMALDEHYDE STUDY IN FUNERAL HOMES
Am. Ind. Hyg. Assoc. J. 36 (7): 533-7 (1975)

Formaldehyde is identified as a toxic gas that causes burning of the eyes, lacrimation, and irritation of the upper respiratory passages. Although incidents of its irritating effects have been reported among workers exposed to formaldehyde in such industries as textiles and paper-processing, no studies have been reported on exposure to this compound in the form of formalin. This study, therefore, was conducted to determine the levels of formaldehyde to which embalmers are exposed. Additionally, a brief toxicity survey was conducted. Vapor levels in six embalming rooms, on the basis of 187 samples, ranged from 0.09 to 5.26 ppm. The current TLV for formaldehyde is 2 ppm. Three out of 7 embalmers has asthma or sinus problems; others showed certain symptoms characteristic of formaldehyde irritation. Paraformaldehyde powders, when sized, contained a respirable fraction. In certain respects, control measures in the embalming rooms were not adequate.

25-0040
GENERAL INFORMATION

Oliver, R.M.
TOXIC EFFECTS OF 2,3,7,8 TETRACHLORODIBENZO 1,4 DIOXIN IN LABORATORY WORKERS
Brit. J. Ind. Med. 32 (1): 49-53 (Feb. 1975)

Two of three scientists with transient minimal exposure to the title compound, also called dioxin, were found to have typical chloracne. Two years after initial exposure to dioxin, one of the two individuals with chloracne and the third scientist experienced delayed symptoms, including personality changes, other neurological disturbances, and hirsutism. All three had raised serum cholesterol. Their symptoms are presumed due to dioxin intoxication.

25-0041
GENERAL INFORMATION

Langard, Sverre and Norseth, Tor
A COHORT STUDY OF BRONCHIAL CARCINOMAS IN WORKERS PRODUCING CHROMATE PIGMENTS
Brit. J. Ind. Med. 32 (1): 62-5 (Feb. 1975)

Three out of 24 workers employed for more than three years in a company producing chromate pigments had bronchial cancer, an excessive rate compared to that of the general population. Workers were exposed mainly to zinc chromate dust, and those developing bronchial cancer may have been exposed to 0.5-1.5 mg Cr/cu m for six to nine years. Smoking may have contributed to their illness. Previously, most respiratory cancer cases traceable to chromate have been in the chromate-producing industry, with just a few in the chromate pigment industry.

25-0042
GENERAL INFORMATION

Hoover, Robert and Fraumeni, Joseph F., Jr.
CANCER MORTALITY IN U.S. COUNTIES WITH CHEMICAL INDUSTRIES
Environ. Res. 9 (2): 196-207 (April 1975)

An excessive rate of deaths in males from cancer of the bladder, lung, liver (and some other cancers) during 1950-1969 correlated with the 139 U.S. counties having the highest concentration of chemical industries. Although some confounding variables may limit definite conclusions from this study of mortality some interesting, compatible correlations were noted. For instance, the excess of deaths from bladder cancers, which was associated with the dye, pharmaceutical, paints, and printing ink industries corresponded with the high risk of bladder cancers linked to worker exposure to β-naphthylamine, benzidine, paints, and printing inks. This study suggests new clues to potential carcinogenic chemicals and indicates areas of further study in industrial groups.

25-0043
GENERAL INFORMATION

Carpenter, C.P. et al
PETROLEUM HYDROCARBON TOXICITY STUDIES I. METHODOLOGY
Toxicol. Appl. Pharmacol. 32 (2): 246-62 (May 1975)

Protocols established by the API Toxicology Committee and the Chemical Hygiene Fellowship for studying the inhalation toxicity of petroleum hydrocarbons are presented. The major objective was to obtain background data for recommending hygienic standards for hydrocarbons. Procedures for acute and subacute inhalation toxicity tests are described. Compounds are arranged in a matrix based on boiling range and aromaticity, intended to give sufficient breadth of coverage to permit predicting the toxicity of any mixture within the parameters.

25-0044
GENERAL INFORMATION

Anon
OSHA PROPOSES JOB HEALTH RULES ON SIX KETONES
Am. Ind. Hyg. Assoc. J. 36 (7): 517 (1975)

OSHA has proposed supplemental job health standards for exposure limits to 2-butanone, 2-pentanone, cyclohexanone, hexone, methyl n-amyl ketone, and ethyl butyl ketone. These colorless, industrial solvents can cause dizziness, nausea, narcosis leading to coma, dermatitis (on repeated contact), and other symptoms.

Anon
SAN FRANCISCO BAY AREA
JAPCA 25 (7): 746 (1975)

The San Francisco Bay Area Air Pollution Control District has announced some explanations for its recently-enacted Regulation Eight, covering the control of asbestos fibers. One of the five major features of Regulation Eight requires that the APC Officer be given 10 days notice before demolition starts on any building larger than four units which contains insulation because asbestos is widely used in insulation materials. After 1 July 1976, the use of any asbestos in insulation spraying operations will be prohibited.

Reimschuessel, H.K. et al
PROC. NIEHS CONF. ON PUBLIC HEALTH IMPLICATIONS OF COMPONENTS OF PLASTICS MANUFACTURE, PINEHURST, N. CAROLINA, JULY 29-31, 1974
Environ. Health Perspectives 11 7-225 (June 1975)

Introductory comments and 30 papers presented at a conference, sponsored by the National Institute of Environmental Health Sciences, are concerned with public health implications associated with manufacturing, processing and use of polymeric materials, The first paper, "General aspects in polymer synthesis," by H.K. Reimschuessel, was followed by papers on processing of plastics, aging of polymers, additives in plastics and in fibers and fabrics. Other papers discussed the industrial preparation of PVC, the fate of inhaled VCM in rats, and proportional mortality among VC workers. Other papers were concerned with the respiratory effects of TDI; pulmonary response to polyurethane dust; biochemical toxicology of unsaturated halogenated monomers; ulcerogenic effects of alkyl nitriles (acrylonitrile, propionitrile), amines and thiols; toxicology of octabromobiphenyl and decabromodiphenyl oxide; mortality patterns of workers exposed to chloromethyl ethers (CMME and BCME). A paper by E.M. Pearce and R. Liepins on flame retardants identifies the primary types of flame retardants used in plastics and discusses consumption patterns and market size.

26-0002
ARSENIC

Blot, William J. and Fraumeni, Joseph F., Jr.
ARSENICAL AIR POLLUTION AND LUNG CANCER
Lancet II (7926): 142-4 (July 26, 1975)

The finding that lung-cancer mortality rates of men and women in the U.S. from 1950-1969 were higher in a group of counties where copper, lead and zinc are smelted than in other parts of the country indicates that inorganic arsenic, like asbestos, may be a carcinogenic hazard to the general community and not just to the workers exposed to it. Arsenic is found in ores containing copper, lead, zinc, and other metals; inorganic arsenic is emitted as an airborne or solid product when these ores are smelted.

26-0003
ARSENIC

Fassbender, H.W.
SOLUBILITY AND FRACTIONATION CRITERIA FOR EVALUATING ARSENIC- PHOSPHORUS RELATIONSHIPS IN SOILS
AMBIO 4 (3): 134-5 (1975)

A solubility diagram was developed for the arsenate expected in soils; the forms of arsenic and phosphorus were fractionated and their activities in equilibrium soil solutions were measured. A parallelism was noted in the binding of arsenic and phosphorus to aluminum, indicating the coprecipitation of Al-arsenic-phosphate in soils.

This study indicates that available knowledge of phosphorus chemistry can be useful in order to learn more about arsenic chemistry. The latter knowledge is needed for control of arsenic contamination in the environment, e.g., combatting the danger to groundwater from the deposition of arsenic industrial residues.

26-0004
ARSENIC

Anon
MANAGEMENT OF HAZARDOUS WASTE IS INADEQUATE
The Dec Newsletter (Nebraska) 3 (1): 1 (July 1975)

The need for more effective means of treating and disposing hazardous wastes is emphasized by this example: several people in Perkham, Minnesota, were hospitalized as the result of drinking water contaminated by arsenic. The water was from a well drilled near a deposit of arsenic that had been buried 30 years ago.

26-0005
ARSENIC

Garner, Fradley
DOUBLE STANDARD FOR ARSENIC?
Environ. 17 (5): 36-7 (July/Aug. 1975)

The 690 barrels of arsenic (and its byproducts, arsenic oxide and iron oxide) that Finland could not dump into the South Atlantic because of protests from the Scandinavian countries, Africa, and South America, has been stored in Naadendal, Finland, pending a decision on its final disposal. According to Neste Oy, the Finnish national oil company, the arsenic waste from its two oil refineries was accumulated over 10 years, but the Swedish firm, Ronnskarsverken, dumps as much arsenic into the Gulf of East Bothnia in a day. The Danes fear the emergence of a double standard among the Nordic countries over pollution issues.

See: 26-0001, Acrylonitrile

See: 26-0001, Acrylonitrile

*26-0006
FLUOROCARBONS

Lovelock, J.E.
NATURAL HALOCARBONS IN THE AIR AND IN THE SEA
Nature 256 (5514): 193-4 (July 17, 1975)

Measurements of methyl chloride in the air and coastal waters of southern England from Dec. 1974 to April 1975 confirm that methyl chloride is the dominant halocarbon in the atmosphere. This finding is discussed in connection with the destruction of ozone in the stratosphere from chlorofluorocarbons. The presence of other chlorine compounds suggests that less than 20% of the chlorine entering the stratosphere is due to freons. The lesser stability of methyl chloride indicates its destruction in the stratosphere, releasing its chlorine. The more stable chlorofluorocarbons entering the stratosphere probably return to the troposhphere. Uncontrolled accumulation of freons in the atmosphere could eventually reach hazardous concentrations but, at this time, they appear to be a minor source of stratospheric chlorine.

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*26-0007
FLUOROCARBONS

Anon
JOHNSON DROPS FLUOROCARBON PROPELLANTS
Soap, Cosmet. Chem. Spec. 51 (7): 52 (1975)

Recent announcement by S.C. Johnson & Son, Inc., that it was discontinuing fluorocarbon propellants in its variety of aerosol products, although announced because of present uncertainty over effects of the compounds on stratospheric ozone, is based on other reasons.

The company, fifth largest aerosol marketer, has cut down on fluorocarbons over the last 15 years, using mostly other propellants (butane and propane gases) during last 3 years in water-based aerosols. Non-fluorocarbon propellants are cheaper.

*26-0008
FLUOROCARBONS

Anon
ANOTHER GROUP WANTS BAN ON FLUOROCARBON PROPELLANTS
Chem. Wk. 117 (6): 26 (Aug. 6, 1975)

The Natural Resources Defense Council has asked FDA to ban fluorocarbon-propelled aerosol sprays, citing that findings by the National Oceanic and Atmospheric Administration and the National Center for Atmospheric Research offer conclusive proof of ozone layer destruction by fluorocarbon gases.

26-0009
HALOETHERS

Stallman, Jeanne M.
WORK. WHAT YOU DON'T KNOW.
Environ. 17 (5): 37-8 (July/Aug. 1975)

Citing the delay in alerting the public and workers to the carcinogenic potential of bis-chloromethyl ether (BCME), the author claims that production demands outweigh safety considerations. The discovery of lung cancers in three young workers exposed to BCME, the early studies by Dow Chemical indicating the carcinogenic potential of BCME, and the discovery of other lung cancers in workers, were not brought to public attention until 1973.

BCME, a contaminant of chloromethyl methyl ether (CMME), can be formed by the reaction of formaldehyde with hydrogen chloride and by other chemical reactions carried out by many chemists. Concentrations of 250 and 1500 ppm BCME over formalin slurries of ferric chloride and aluminum chloride have been reported. BCME may be a hazard to textile, paper, and other workers and also to laboratory personnel.

HALOETHERS

See: 26-0001. Acrylonitrile

26-0010
HYDRAZINE

Pozharisski, K.M. et al
THE MECHANISM OF CARCINOGENIC ACTION OF 1,2-DIMETHYLHYDRAZINE (SDMH) IN RATS
Int. J. Cancer 15 (4): 673-83 (1975)

Subcutaneous administration of 1,2-dimethylhydrazine (SDMH) induced colonic tumors in rats. The study suggests that the carcinogenic effect of SDMH may be due to its "active" metabolite, which forms a conjugate with glucuronic acid on the liver, which interacts with certain tissues.

26-0011
HYDRAZINE

Elkort, Richard J. et al
EARLY NEOPLASIA OF RABBIT PANCREATIC DUCTAL CELLS INDUCED BY DIMETHYLHYDRAZINE
Cancer Res. 35 (8): 2292-3 (Aug. 1975)

The authors report a carcinoma arising in the pancreatic ductal cells of a rabbit in which a catheter containing dimethylhydrazine had been implanted. Because of negative results in other tests, the authors caution about the acceptability of their evidence. Further studies are underway to confirm their initial results

26-0012
ISOCYANATES

Anzuino, G. et al
REACTION OF DIISOCYANATES WITH ALCOHOLS. I. UNCATALYZED REACTIONS
J. Polym. Sci. (Polym. Chem. Ed.) 13 (7): 1657-66 (1975)

The wide use of diisocyanates in the production of urethane elastomers and foams argues for the need of knowing more about the contribution of the secondary reactions to the overall reaction between diisocyanates and polyether glycols. A mathematical method for calculating rate constants for the primary and secondary reactions (urethane and allophanate formation, respectively) has been verified with experimental data.

26-0013
ISOCYANATES

Anzuino, G. et al
REACTION OF DIISOCYANATES WITH ALCOHOLS. II. CATALYZED REACTIONS
J. Polym. Sci. (Polym. Chem. Ed.) 13 (7): 1667-75 (1975)

The mathematical method previously suggested for calculating rate constants for the primary and secondary reactions between isocyanates and alcohols is applied here to the catalyzed reaction. The study defined the selectivity of three different kinds of catalysts: acyl chlorides, tertiary amines, and metallic salts.

ISOCYANATES

See: 26-0001, Acrylonitrile

26-0014
MODEL ECOSYSTEMS

Wiebe, William J. and Bancroft, Keith
USE OF THE ADENYLATE ENERGY CHARGE RATIO TO MEASURE GROWTH STATE OF NATURAL MICROBIAL COMMUNITIES
Proc. Nat. Acad. Sci. U.S.A. 72 (6): 2112-5 (1975)

After measuring the ATP-ADP-AMP ratios in bacterial samples from ocean waters, estuarine sediments and from laboratory-grown microbial cultures, the authors report similar ratios for each of the four colonial growth phases (lag, logarithmic, stationary, and death phase).

Their findings indicate that the use of the "energy charge ratios" can provide a simple diagnostic method for estimating the community growth state and the effects of environmental change.

26-0015
MODEL ECOSYSTEMS

Sikka, H.C. et al
DEGRADATION OF CARBARYL AND 1-NAPHTHOL BY MARINE MICROORGANISMS
Bull. Environ. Contam. Toxicol. 13 (6): 666-72 (1975)

The pesticide, carbaryl (1-naphthyl N-methylcarbamate), readily hydrolyzes to 1-naphthol non-biologically in sea water. To determine the fate of carbaryl, the authors tested the degradation of carbaryl and of 1-naphthol by selected species of marine bacteria, yeasts and filamentous fungi.

Carbaryl was less susceptible to degradation than was 1-naphthol. The latter was more susceptible to degradation by the filamentous fungi than by the bacteria or yeasts used.

See also: 26-0037, General Information

Martin, D.F.
A NOTE CONCERNING THE ENVIRONMENTAL ACCEPTABILITY OF NITRILOTRIACETIC ACID (NTA): THE EFFECT OF NTA ON THE GROWTH OF *GYMNODINIUM BREVE*
Environ. Letters 6 (1): 31-6 (1974)

The Florida red tide organism *Gymnodinium breve* was studied to determine the effects of nitrilotriacetic acid (NTA) on the algae. The flash test of the Provisional Algal Assay Procedure of the Joint Industry/Government Task Force on Eutrophication (1969) was modified for the test runs. Cultures of *Gymnodinium breve* were added to stock solutions in the presence of sewage or without added sewage. NTA (up to 10 ppm) was not toxic to the red tide organism nor did it appear to have a biostimulatory effect.

See also: 26-0035, General Information

26-0017
POLYURETHANES

Benedict, William F. et al
CHARACTERISATION OF HUMAN CELLS TRANSFORMED *IN VITRO* BY URETHANE
Nature 256 (5515): 322-4 (July 24, 1975)

In what they claim is the first documented transormation of human cells *in vitro* from the normal to the malignant state, the authors describe the results of treating two cell lines with urethane. In contrast to the control cells, the transformed cells showed marked fibrinolytic activity.

26-0018
POLYURETHANES

Autian, J. et al
CARCINOGENESIS FROM POLYURETHANS
Cancer Res. 35 (6): 1591-6 (1975)

Seventeen different polyurethanes and a polyethylene were implanted i.p. in male rats; 13 polyurethanes were implanted in female rats. During 24 months, malignant tumors developed in 292 of 577 males and in 248 of 438 females given polyurethan implants; tumors also occurred in 29 of 38 males and 20 of 36 females given polyethylene implants. No tumors developed in the first seven months. It is not clear that the tumors developed from biological degradation of the polymers to active carcinogens rather than via the solid-state mechanism, although efforts were made to avoid tumor formation via the latter route.

Anon
USE OF TRICHLOROETHYLENE FOR COFFEE DECAFFEINATION IS BEING STOPPED. . .
Chem. Eng. News 53 (30): 4 (July 28, 1975)

Reversing its earlier rebuttal of the potential carcinogenicity of trichloroethylene, General Foods Corp. reports that it will substitute methylene chloride for trichloroethylene in its Sanka and Brim decaffeinated coffees. NCI, however, is also studying methylene chloride.

TRICHLOROETHYLENE

See also: 26-0035, General Information

See: 26-0001, Acrylonitrile

26-0012, Isocyanates

26-0013, Isocyanates

26-0020
SHALE OIL EXTRACTION AND REFINING

Anon
OIL SHALE ECONOMICS
Environ. Rept. 6 (7): 52 (Aug. 4, 1975)

In-situ recovery of oil from shale might cut environmental problems, but is not seen as economically feasible. In-situ processing could, however, compete on a cost basis with above-ground processing, if state-of-the-art technology were used. In its "Report SAND-74-0146 (available from NTIS), the Systems Studies Division IV, Sandia Laboratories, NM, reports that an in-situ processing complex producing 100,000 barrels of oil/stream day would need to price the raw crude at $6.80/bbl (1973 prices) for a discounted cash flow rate of return of 15%. Upgrading to a syncrude equivalent to conventional crude oil would raise the barrel price to $9.80. An upgraded crude price of only $7.64 might be possible, if retort efficiency were improved.

26-0021
SHALE OIL EXTRACTION AND REFINING

Anon
ENERGY DEVELOPMENT/ARID LANDS
Environ. Rept. 6 (7): 52 (Aug. 4, 1975)

In "The Impact of Energy Development on Water Resources in Arid Lands, Literature Review and Annotated Bibliography," the Office of Arid Lands Studies, University of Arizona, suggests that more emphasis be placed on energy conservation by the public and industry rather than pushing energy development plans in arid regions. Too little is known about the environmental effects associated with such development, which might deplete the area water supplies or change their quality. Air pollution, land destruction, and an influx of people into the areas are other potential effects.

Anon
OIL-SHALE/COLORADO
Environ. Rept. 6 (6): 48 (July 28, 1975)

The potential effects on the surface and ground-water systems of Colorado's Piceance Basin from oil-shale development are described in the 84-page "Report SN 2401-02578," available from Supt. of Documents, GPO, Wash., D.C. 20402 for $3.15.

26-0023
VINYL CHLORIDE
(Production)

Anon
VINYL CHLORIDE OUTPUT COULD DROP. . .
Chem. Eng. News 53 (30): 7 (July 28, 1975)

Production of vinyl chloride in 1975 might reach only 3.7 billion lb, or 2 billion lb less than 1974, because of a continued, lower demand for PVC, which is not related to the cancer scare. Nevertheless, an increase in vinyl chloride production in 1976 to the 1974 level would still strain capacity, estimated at 6.6 billion lb. This is because of the low optimum operating rate of about 85%, which will not be increased too dramatically in the near future. Only Borden has announced any expansion plans, and these do not call for a large additional capacity.

26-0024
VINYL CHLORIDE

Anon
BIRTH DEFECTS CANNOT BE CORRELATED WITH VINYL CHLORIDE EXPOSURE. . .
Chem. Eng. News 53 (31): 10 (Aug. 4, 1975)

A report by the Ohio Dept. of Health connecting a significant increase in birth defects in three communities with polyvinyl chloride polymerization plants, was refuted by the Center for Disease Control. None of the parents in the Ohio cases had worked in the plants or lived within 2 miles of them. No unusual increase in birth defects was observed in the children of a Pennsylvania community, similar to the Ohio communities.

26-0025
VINYL CHLORIDE

Bartsch, H. et al
HUMAN, RAT AND MOUSE LIVER-MEDIATED MUTAGENICITY OF VINYL CHLORIDE IN *S. TYPHIMURIUM* STRAINS
Int. J. Cancer 15 (3): 429-37 (1975)

These studies indicate that human, mouse, or rat liver can efficiently convert vinyl chloride monomer into mutagenic metabolites. Assays were performed on pooled tissue samples (3-5 animals) using certain *S. Typhimurium strains*. Biopsied human livers samples were also employed after 6 hours exposure to vinyl chloride, the mutagenic response of one strain (TA 1530) was enhanced 4-7 fold. The relative mutagenic activities of VC Mare described. Although the studies do not identify the particuler metabolite (or metabolites) responsible for VCM carcinogenicity, chloroacetaldehyde showed a strong toxicity in the TA 1530 strain; the urinary excretion product, chloroacetic acid was also toxic; and chloroethanol was weakly mutagenic for TA 1530. In a test on vinylidene chloride, the mutagenic effect was higher than that observed with VCM.

26-0026
VINYL CHLORIDE

Reynolds, Edward S. et al
ACUTE LIVER INJURY BY VINYL CHLORIDE: INVOLVEMENT OF ENDOPLASMIC RETICULUM IN PHENOBARBITAL PRETREATED RATS
Environ. Health Perspectives 11: 227-33 (1975)

A single 6-hr exposure to vinyl chloride monomer (5%) produces extensive vacuolization of centrolobular liver parenchyma and focal midzonal necrosis in the hepatic lobuole in phenobarbital-pretreated rats. Ultrastructurally, vacuolization consists of dilation of cysternae of rough endoplasmic reticulum and in the same cells smooth endoplasmic reticulum coalesces into discreet aggregates resembling denatured membranes. The findings support the hypothesis that vinyl chloride is hepatotoxic because it is converted into a toxic metabolite by components of the mixed function oxidase system of liver endoplasmic reticulum.

26-0027
VINYL CHLORIDE

Drew, Robert T. et al
EFFECTS OF VINYL CHLORIDE EXPOSURES TO RATS PRETREATED WITH PHENOBARBITAL
Environ. Health Perspectives 11: 235-42 (1975)

Male rats were exposed to 10 consecutive days, 6 hr/day, to vinyl chloride vapors at an average concentration of 13,500 ppm. The exposed rats were divided into three groups of eight rats each: one group was pretreated with 3-methylcholanthrene, one group was pretreated with phenobarbital, and the third group received no treatment. Half the animals in each group were sacrificed 18 hr after the last exposure and half were sacrificed 4 days later. In a second experiment, four rats pretreated with phenobarbital were exposed to vinyl chloride vapors at a concentration of 17,300 ppm for 2 days and sacrificed about 9 A.M. on the third day. In both experiments control animals, also treated with phenobarbital or 3-methylcholanthrene, were exposed to air only. At the time of sacrifice, lungs, kidneys, spleen, heart, and a small piece of liver from each animal were preserved for histological examination. The remainder of the liver was processed for assay of microsomal enzyme activity.

The following parameters were investigated: growth rate, organ weights, morphological changes, and both benzphetamine-*N*-demethylase activity and cytochrome P-450 content of microsomes prepared from the livers. In both experiments the only marked difference noted in any group was a decrease in the growth rate of the animals exposed to vinyl chloride and treated with phenobarbital. This decreased growth rate was particularly apparent on the third day of the vinyl chloride exposures. Occasional morphological changes were also seen in the livers of the animals treated with phenobarbital and exposed to vinyl chloride.

26-0028
VINYL CHLORIDE

Miller, Albert
PULMONARY FUNCTION DEFECTS IN NONSMOKING VINYL CHLORIDE WORKERS
Environ. Health Perspectives 11: 247-50 (1975)

Pulmonary function was assessed by spirometry and maximum expiratory flow-volume curves to determine whether exposure to an occupational environment contaminated with vinyl chloride (VC) fumes and poly(vinyl chloride) (PVC) dust is associated with an increased risk of respiratory impairment. Data were analyzed for smoking, duration of exposure, and age. The high prevalence of impaired flow (57.5%) could not be attributed to smoking. Prevalence in nonsmokers was 36.4% when exposure was less than 10 yr, 42% when exposure was between 10 and 20 yr, and 80% when exposure exceeded 20 yr. The last is virtually the same rate as for smokers exposed more than 20 years. The same trend is shown with incrasing age. Unlike younger workers, when smokers and nonsmokers ≥ 40 years of age are compared, prevalence rates of air flow impairment are not statistically different. The present investigation is one of the few in which the effects of occupational exposure could be separated from and were found to predominate over the effects of smoking.

Warren, Helen and Huff, James Edward
HEALTH EFFECTS OF VINYL CHLORIDE MONOMER:
AN ANNOTATED LITERATURE COLLECTION
Environ. Health Perspectives 11: 251-319 (1975)

This annotated bibliography (264 references) covers the literature on the health aspects of vinyl chloride from 1835-1975. Only 17 reports on the toxic effects of VC were published in the 125 years from 1835 to 1959. In contrast, in the five years from 1970 to 1974 a total of 102 reports were published.

VINYL CHLORIDE

See: 26-0001, Acrylonitrile

See: 26-0025, Vinyl Chloride

*26-0030
ETHYLENE DIBROMIDE

Anon
ENVIRONMENTAL DEFENSE FUND ASKS BAN ON ETHYLENE DIBROMIDE
Environ. Health Letter 14 (15): 8 (Aug. 1, 1975)

NIOSH estimates that large numbers of fumigators and exterminators (8,900) have been exposed to the grain fumigant, ethylene dibromide (EDB). Residues of the compound up to 6.10 ppm have been found in treated grain. NIOSH has shown EDB to be carcinogenic in rats and mice. The Environmental Defense Fund wants EPA to investigate EDB use on a priority basis and to suspend or cancel its registration, if necessary.

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*26-0031
ETHYLENE DIBROMIDE
(Uses)

Anon
FOREST PESTS PESTERED
Chem. Wk. 116 (26): 18 (June 25, 1975)

An all-out attack by U.S. and state forestry agencies on pesticides follows latest big outbreak of forest pests and involves use of a variety of pesticides and insecticides.

Ethylene dibromine, a dibromoethane produced by Great Lakes Chemical and Kerr-McGee, is being used to combat infestations of mountain pine beetles in the Black Hills of S. Dakota and Wyoming and in Colorado.

Anon
MEANWHILE, ETHYLENE DIBROMIDE BECAME THE TARGET OF A NIOSH CANCER ALERT. . .
Chem. Eng. 82 (16): 38 (Aug. 4, 1975)

The National Cancer Institute's findings that ethylene dibromide (EDB) had strong carcinogenic activity in both rats and mice, producing malignancies of the stomach in 70 of 92 mice and in 82 of 94 rats fed the compound, has prompted NIOSH to issue a cancer alert on this compound. EDB has not yet been identified as a human carcinogen.

26-0033
GENERAL INFORMATION

Anon
AUTO CATALYSTS WORK WITH LEADED GASOLINE
Chem. Eng. News 53 (31): 8 (Aug. 4, 1975)

Du Pont announces a new series of automobile catalysts, incorporating platinum and palladium in a perovskite crystal structure, that can be used even with leaded gasoline.

26-0034
GENERAL INFORMATION

Anon
EPA SUSPENDS USE OF HEPTACHLOR, CHLORDANE
Chem. Eng. News 53 (31): 7 (Aug. 4, 1975)

EPA plans to suspend the manufacture, distribution, and most major uses of heptachlor and chlordane because continuing animal feeding studies are confirming their potential carcinogenicity. Existing stocks can be sold and used. Velsicol, the single U.S. manufacturer of the two pesticides, will request a hearing.

26-0035
GENERAL INFORMATION

Anon
TWO SOLVENTS CLEARED AS CANCER THREAT
Chem. Eng. News 53 (31): 7-8 (Aug. 4, 1975)

According to inhalation studies on rats conducted over 24 months by Dow Chemical, neither 1,1,1-trichloroethane or perchloroethylene are carcinogenic in rats.

On the other hand, NCI recently announced that another solvent, trichloroethylene, induced liver cancer and other tumors in mice in a series of feeding studies.

26-0036
GENERAL INFORMATION

Broecker, Wallace S.
CLIMATIC CHANGE: ARE WE ON THE BRINK OF A PRONOUNCED GLOBAL WARMING?
Science 189 (4201): 460-3 (Aug. 8, 1975)

Natural climatic cooling, which has been going on over the past several decades, will soon bottom out and will be followed by a period of higher mean global temperatures on our planet. This will be due to the warming effect of the carbon dioxide released to the atmosphere from the combustion of chemical fuels. This reversal is expected to take place within a decade or so.

26-0037
GENERAL INFORMATION

Fisher, Nicholas S.
CHLORINATED HYDROCARBON POLLUTANTS AND PHOTOSYNTHESIS OF MARINE PHYTOPLANKTON: A REASSESSMENT
Science 189 (4201): 463-4 (Aug. 8, 1975)

Some marine phytoplankton cultures exhibited reduced photosynthesis in the presence of pollution by DDT and PCB's (polychlorinated biphenyls). This could affect the quality of the food supply of marine herbivore populations, thereby having a deleterious effect on marine ecosystems.

26-0038
GENERAL INFORMATION

Ramamoorthy, S. and Kushner, D.J.
HEAVY METAL BINDING SITES IN RIVER WATER
Nature 256 (5516): 399-401 (July 31, 1975)

The transport of heavy metals and their effects on biological systems in natural waters are discussed. Ion-specific electrodes offer convenient and sensitive means of studying the dynamics of the transport and utilization of heavy metals in natural waters.

26-0039
GENERAL INFORMATION

Lehtomäki, M. and Niemelä, S.
IMPROVING MICROBIAL DEGRADATION OF OIL IN SOIL
AMBIO 4 (3): 126-9 (1975)

Laboratory and field tests conducted to accelerate oil degradation in soil have employed physical, chemical and biological means. None of the methods tried (aeration, irrigation, fertilizers, addition of microbes) were as effective as the addition of brewery waste yeast, which accelerated the oil waste decomposition rate substantially.

26-0040
GENERAL INFORMATION

Linden, O.
ACUTE EFFECTS OF OIL AND OIL/DISPERSANT MIXTURE ON LARVAE OF BALTIC HERRING
AMBIO 4 (3): 130-3 (1975)

The effects on most marine life caused by oil spills will be seriously aggravated by chemical dispersants added to clean up the oil. Since oil forms a surface slick it will lose a considerable amount of its toxic compounds from evaporation within a few days. Surfactants used with oil would make the oil adhere to surfaces not usually wettable by oil, e.g., the slimy mucus of fish. Tests conducted on newly hatched herring larvae showed the oil/dispersant combination to be 50-100 times more toxic than self-dispersed crude oil.

26-0041
GENERAL INFORMATION

Myers, Vernon B. et al
THE EFFECT OF SALINITY AND DISSOLVED ORGANIC MATTER ON SURFACE CHARGE CHARACTERISTICS OF SOME EURYHALINE PHYTOPLANKTON
J. Exp. Marine Biol. Ecol. 17 (1): 59-68 (1975)

The influence of salinity and dissolved organic carbon (DOC) on the net surface charge and mercury uptake by three species of euryhaline estuarine phytoplankton were examined by microelectrophoresis. Results indicate that adsorption of dissolved organic matter determines the negative surface charge of many phytoplankton. Mercury uptake by the cell surface appears to be slowed by chelation of mercury by humic acids. The results reported could be useful in setting up water quality standards for trace metals, humic chelation processes having been earlier claimed to make heavy metals unavailable to algae.

26-0042
GENERAL INFORMATION

Brown, Martin
AN ORANGE IS AN ORANGE
Environ. 17 (5): 6-11 (July/Aug. 1975)

Excessive use of pesticides could be prevented by educating the public to accept fruit with insect-caused skin blemishes. The author bases his case on the example of the citrus thrips, a tiny pest that feeds on the skin of citrus fruits but does not affect the eating quality of the fruit. Nevertheless, farm workers are suffering chronic and acute health effects from the parathion and other organophosphate insecticides used to combat thrips in order to market "cosmetically-acceptable" fruits.

26-0043
GENERAL INFORMATION

Resnikoff, Marvin
EXPENSIVE ENRICHMENT
Environ. 17 (5): 28-35 (July/Aug. 1975)

An economic analysis of the nuclear reprocessing industry considers the costs versus increased safety of the facilities to the workers and the environment.

26-0044
GENERAL INFORMATION
(New Products)

Anon
GULF OIL GETS RIGHTS TO FAMILY OF POLYIMIDES
Chem. Wk. 117 (6): 10 (Aug. 6, 1975)

Hughes Aircraft has developed a new family of high-performance polyimides, based on Gulf Oil's proprietary intermediate, benzophenone tetracarboxylic acid dianhydride (BTDA). Capable of withstanding temperatures up to 800°F, stable in air at 700°F for long periods, and claimed to be good adhesives for titanium metal alloys, these polyimides should find a market in electronics, auto, aerospace, appliance, and solid lubricant industries. Gulf Oil has exclusive production and marketing rights.

26-0045
GENERAL INFORMATION

Anon
PESTICIDES/MARINE TRANSPORT
Environ. Rept. 6 (6): 44 (July 28, 1975)

Despite curtailed use of chlorinated hydrocarbon pesticides in recent years, EPA-sponsored research indicates that these pesticides may be transported from land drainage basins, after they are absorbed in sediments. DDT, for example, was detected in sediments in Monterey Bay, California at average concentrations of 3.7 ppb and maximum concentrations of 19.3 ppb in 1971 and at concentrations of 15.5 ppb (average) and 83.1 ppb (maximum) in 1974. The National Environmental Research Center, Office of Research and Development EPA, Corvallis, OR 97330, has copies of "An Analysis of the Dynamics of DDT in Marine Sediments," EPA-660/3-75-013, available without charge.

26-0046
GENERAL INFORMATION

Anon
NEW POWERPLANTS/CLIMATE
Environ. Rept. 6 (6): 44 (July 28, 1975)

A special "laser-like" device, acoustic sounders, and an instrumented trailer called the "Sniffer", will characterize aerosol particles emanating from power plants. Air will be monitored in various midwestern regions before new power plants start up and after operations begin. The chemical and meteorological effects of these particles and their reactions with potentially hazardous sulfate emissions will be studied. Additional information on "atmospheric studies of Western power plants" is available from Wave Propagation Laboratory, Environmental Research Laboratories, NOAA, Boulder, CO 80302.

26-0047
GENERAL INFORMATION

Anon
TOXICOLOGY/BEHAVIOR
Environ. Rept. 6 (6): 48 (July 28, 1975)

"Behavioral Toxicology: Early Detection of Occupational Hazards," SN 1733-00031, contains information on the detection of reversible functional changes in workers exposed to industrial chemicals. This collection of papers and proceedings of a 1973 workshop on the subject topic is available from Supt. Documents, GPO, Wash., D.C. 20402, at $7.45.

26-0048
GENERAL INFORMATION

Miller, Albert
SCREENING TESTS FOR PULMONARY FUNCTION ABNORMALITY
Environ. Health Perspectives 11: 243-6 (1975)

Although clinical or radiographic tests can provide evidence of airway and parenchymal pulmonary impairment resulting from occupational or environmental exposure to harmful chemicals, the simple screening tests described here, based on a voluntary forced expiration, can result in an earlier detection of pulmonary symptoms.